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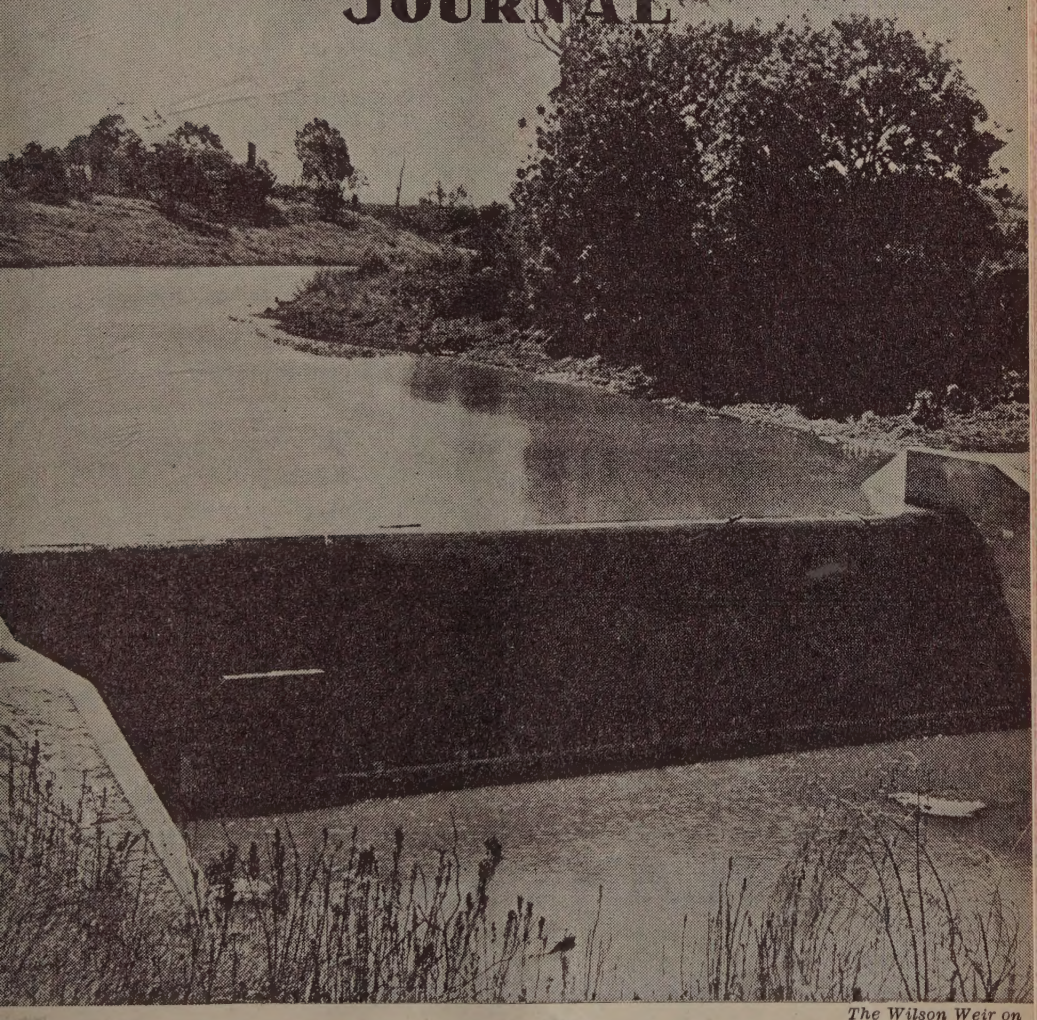

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LEADING FEATURES

Peanut-Growing
Land Utilization
The 1946 Burdekin Flood
Cabbage-Growing
Control of Vegetable Diseases
Maori Mite in Midsummer
Losses from Water Blister
Queensland Butter Production

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Volume 63 Part 6

QUEENSLAND AGRICULTURAL JOURNAL

Edited by
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QUEENSLAND AGRICULTURAL JOURNAL

Volume 63 1 DECEMBER, 1946 Part 6

Event and Comment.

Changing Dairy Practices.

AS with other primary industries, the dairy industry has had to make adjustments to fit in with changing circumstances. According to Annual Report of Department of Agriculture and Stock, the advisory and extension services of the Division of Dairying have been adapted in accordance with altered practices on dairy farms and in factories.

Machine-milking has increased notably in recent years, stimulus being given by the diminishing labour supply position in rural areas. It is estimated that 30 per cent. of dairy farmers throughout the State now use milking machines, while the percentage is as high as 85 in some specialized dairying districts. Recent investigations have shown that, by a proper appreciation of the essentials of hygiene and mechanical care, milk and cream of the highest quality can be produced by mechanical milking and that productivity and length of lactation of dairy cows are not affected.

Many farmers forced by wartime exigencies to abandon the stripping of cows milked by machines have found that non-stripping does not affect milk yields or animal health, while it minimizes labour requirements in the shed. Although largely a wartime expedient, it is believed the non-stripping technique will increase in popularity. For success, the milking machine must be in good mechanical condition and efficiently operated.

A service has been inaugurated to assist dairy farmers with the mechanical and sanitary care of farm dairy machinery, especially milking machines and separators. Field days have been organized in many centres in co-operation with branches of the Queensland Dairymen's Organization. Visits were also made to farms for the purpose of checking plants and remedying any defects. At these demonstrations particular

attention was given to pulsators, vacuum gauges, speeds of plants, air leaks, rubber inflations of milking machines, and the foundation, level setting, height of bowl, discs and speed of separators, as well as operational care and cleansing procedure.

Field officers in dairying districts where a large proportion of farms is equipped with milking machines have now been provided with vacuum gauges and are in a position to offer sound advice to producers on the care and operation of milking machines and separators.

Coupled with machine-milking and the increasing installation of steam sterilizers for dairying purposes, a milking shed has been specially designed with a view to permitting all operations, including the storage of milk and cream, to be conducted in a single building, which affords greater convenience than by dividing the dairy-shed operations among different buildings. With the easing of the supplies of timber and building materials and manpower, numbers of new sheds, designed according to the modified plan, have been constructed. This shed design will also facilitate the cooling of milk and cream, a matter of great importance in the improvement of the quality of dairy produce.

The use of electricity for motive power for the milking machine and the heating of water for use in dairy sheds, although a recent innovation in most dairying districts, is spreading as rapidly as installations become available.

Dairy Production.

THE butter output for the year was 101,242,498 lb., compared with 95,005,539 lb. in the previous year; its estimated value was £7,493,436, as against £6,498,289 in 1944-45. Grading results were:—Choice, 549,357 boxes (36·86 per cent.); first, 835,026 boxes (56·03 per cent.); second, 92,439 boxes (6·21 per cent.); and pastry, 13,463 boxes (1·09 per cent.).

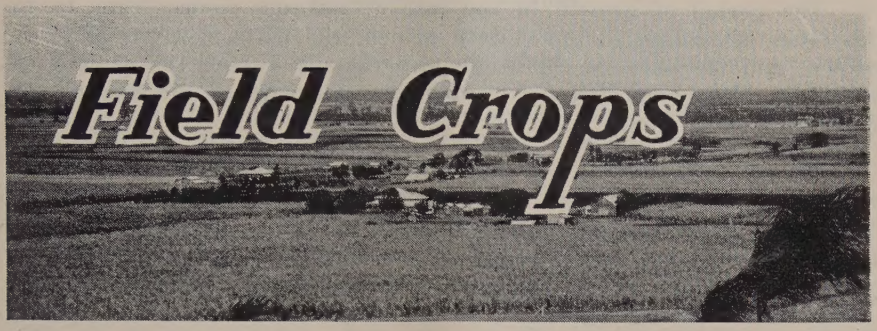
Cheese production amounted to 26,943,245 lb., valued at approximately £1,362,619, as compared with 23,001,555 lb. and £1,109,975 in 1944-45, respectively. Cheese graded officially by Commonwealth and State officers totalled 18,308,511 lb. Results were:—Choice and first grade, 12,863,746 lb.; second, 5,176,916 lb.; third, 267,849 lb.

Despite wartime difficulties, cheese quality has shown a marked improvement in recent years. Grading percentages for 1945-46 were:—Choice and first, 70·27 per cent.; second, 28·28 per cent.; and third, 1·45 per cent.

An adequate and safe supply of pasteurized milk is becoming available in an increasing number of towns throughout the State, but it is considered that the consumption of fresh milk is much lower than it should be, and nutritional authorities stress the importance of greater volume in liquid milk distribution.

A drought relief scheme financed conjointly by the Commonwealth and State Governments was approved and is being administered by the Department in the direction of assisting farmers in drought-stricken districts by monetary grants where farm income was below the equivalent of 75 per cent. of the income for 1943-44.

The dairy research laboratories at Brisbane, Hamilton, and Toowoomba were busily engaged, throughout the year, in addition to routine investigations, on quality control of dairy products, chemical and engineering investigations and surveys, the training of field officers at short-term dairy schools, and general extension work.



Peanut-Growing.*

J. A. KERR, Senior Adviser in Agriculture.

THE peanut plant is a source of highly nutritious food both for human beings and for farm livestock. The uses to which the crop is put are many, and its importance is steadily increasing. As a human food, the kernel itself is consumed raw, salted, or roasted; it is used in various forms of confectionery and in margarine manufacture, and is also marketed as peanut paste and oil. Peanut meal contains up to 48 per cent. crude protein and as a stock food ranks as a high-grade palatable product. The crop may be eaten down by pigs, but its consumption by them will result in objectionable qualities in the carcases. Breeding sows and weaners, however, may be fed limited amounts without detriment. The tops of the plant make a useful though rather coarse hay, which is inferior to cowpea hay both in yield and in protein content. The residue of the crop, after threshing to remove the nuts, is often stacked as reserve fodder.

The peanut is regarded as being a native of Brazil, where several closely allied species are found. It is an annual summer-growing plant which is easily killed by frost, but it will otherwise adapt itself to a wide range of climate, provided soil conditions are favourable. Moderate rainfall, abundance of sunlight, and comparatively high temperatures are necessary for best results with this crop.

The flavour of the kernel and the type of the shell enclosing it have led to the fruit of the peanut plant being incorrectly known as a nut; as the plant belongs to the pea family, the fruit is really a pod. Like other members of that family, its roots bear numerous nodules containing bacteria which make nitrogen in the air available to the plant.

The peanut plant (Plate 124) grows to a height of from 12 to 18 inches and may be of either a bunched or a running habit, the former type being preferred. Owing to its less straggling habit of growth, cultivation of the bunched type of peanut is much easier and harvesting is very much simpler than in the case of a variety possessing a running habit.

The flowers, which are small and yellow, are borne in the axils of the leaves. After pollination, the flower stalk elongates, bends downwards, and carries the developing pod into the soil (Plate 124). This flower stalk is commonly known as a peg, and the pod does not develop unless the peg penetrates the soil.

* Reprinted, with necessary modifications, from *The Queensland Agricultural Journal* for Sept., 1944.

The period of growth in the case of peanuts varies from 16 to 22 weeks, according to the variety grown, the district in which it is grown, and the seasonal conditions experienced during the growth of the crop. Early maturity is usually characteristic of the upright or Spanish type of plants.

The yield of peanuts per acre will naturally vary greatly with soil fertility and with the climatic conditions experienced during growth. Virginia Bunch yields average 100 bushels per acre, though 130 bushels are fairly common and 180 bushels occasionally exceeded. Red Spanish yields average 50 bushels per acre with high yields rarely more than 100 bushels. The average bushel weight of peanuts as delivered by the thresher is 17 lb. for the Virginia Bunch variety and 22 lb. for the Red Spanish variety.

Plate 124.

A PEANUT PLANT SHOWING PEGGING, WHICH IS THE INITIAL FORMATION OF "NUTS."

Suitable Soils.

Well-drained open-textured soils with a high humus content are the most suitable types for the growth of this crop. However, satisfactory crops can be grown on a wide range of soils, but heavy soils which are inclined to become hard and compact should be avoided. Heavy soils frequently produce large crops of peanuts, but considerable losses are experienced on them when harvesting, particularly in varieties which readily shed the pod. Other things being equal, sandy loams usually produce the best results.

Rotations for Peanuts.

Observations indicate that the first crop of peanuts on a soil is usually particularly good, yields of as much as 150 bushels per acre being frequently obtained. Uninterrupted cropping with peanuts, however, reduces the yield to an uneconomic level within a few seasons, and in few crops grown under Queensland conditions is a suitable rotation so essential to the maintenance of a satisfactory standard of production.

The eradication of all weeds in the growing crop, which is essential for the successful production of peanuts, combined with the method of harvesting, entailing as it does the removal of practically the whole plant, result in a serious lowering of the humus content of the soil, with a consequent adverse effect on its physical structure. The combined effect thereof is reflected in reduced yields. An undesirable variation in the ratio between the different soil nutrients following continuous cropping with peanuts is probably also responsible for a reduction in yield.

Plate 125.
A Field of Peanuts in the Kingaroy District.

The selection of suitable crops for rotation with peanuts depends upon the type of farming practised, but where dairying is combined with peanut-growing the problem is somewhat simplified. Queensland climatic conditions are such that the main selections must be made from summer crops, supplemented where possible, however, by winter crops. Maize, grain sorghums, saccharine sorghums, Sudan grass, white panicum, Japanese millet, and potatoes provide some of the possible selections for summer growing. Cowpeas should also be included in the rotation, but there is some evidence to the effect that they should precede the abovementioned fodder crops rather than the peanut crop.

All residues of ordinary crops included in the rotation should be ploughed in, and in the case of the more open soils a bulky fibrous crop, such as Sudan grass, should be included in the rotation and ploughed in as a green manure prior to the planting of the peanut crop. The beneficial results obtained from Rhodes grass as a soil renovator, as indicated by first-crop peanut returns following that grass, suggest the adoption of the practice of grassing available cultivation areas from time to time for periods of from two to three years.

The restriction of peanut-growing to one crop in three years, or to two crops in five or seven years, may prove to be necessary if satisfactory production is to be maintained. The benefits of the rotation will not be limited to the peanuts, but will also be apparent in the other crops which are included in the cropping programme. A rotation, however, must be adopted at an early stage in the utilization of a farm in order to achieve the highest degree of maintenance of soil fertility, and not merely as a measure adopted at a later date to restore the fertility of soils which have been mined rather than farmed. The use of appropriate fertilizers may prove to be necessary and economically sound in rotations, but fertilizers alone will not be sufficient, and planned rotations, suited to the district and the soil, must be adopted.

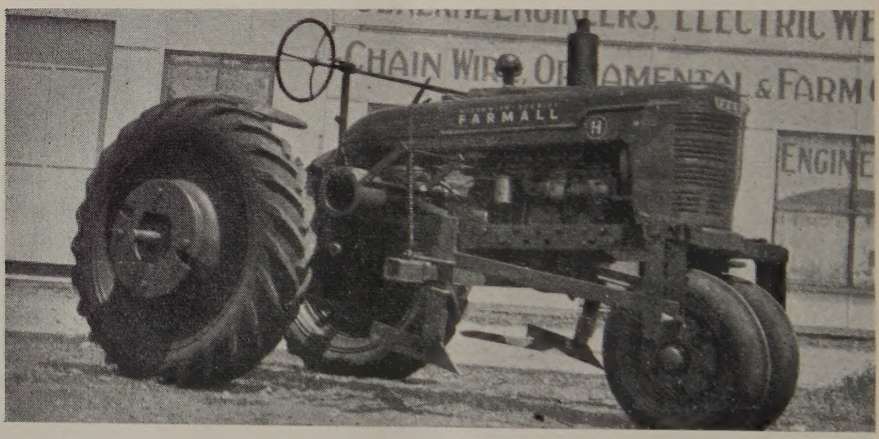


Plate 126.
TRACTOR-TYPE PEANUT CUTTER USED IN HARVESTING.

A field comparatively free from weeds should be selected for the production of peanuts in order to reduce hand work in the growing crop, and cultivation prior to planting should be thorough. If no cover crop is being grown during the winter, the first ploughing should be completed by the end of June, and, if the land is not being contour farmed, should be across the slope of the land, which is then allowed to lie in a rough state until the spring. On land subject to erosion, planting on the contour in combination with broad-base terraces and/or strip cropping should be adopted. Spring ploughing should then be followed by cultivation with the object of producing a loose, fairly fine seed-bed and conserving moisture. A further ploughing may be necessary, but the amount of cultivation required will naturally vary with the soil type and with the weather conditions.

Varieties.

Only two varieties are grown extensively in Queensland, these being the Virginia Bunch and the Red Spanish. The former is a strong-growing variety, and produces a large quantity of dark-green foliage. Virginia Bunch plants, on suitable soils, may reach a height of 12 to 18 inches and a diameter of from 24 to 30 inches. The pods are usually borne fairly close to the centre of the plant, but late flowers may develop and fruit along almost the whole length of the branches. The pods are fairly smooth, of good size and shape, and usually contain two pale-coloured kernels. On maturity, these pods generally break off easily, thus resulting in loss in cases in which harvesting is delayed. Peanuts of the best quality of this variety are usually reserved for the "whole nut" trade. The Red Spanish variety is a smaller plant of semi-erect, bushy habit, with light-green foliage. Its pods, which are closely clustered round the main stem, are small and completely filled with two dark-red kernels. On maturity, they do not break off easily, and so do not present a harvesting problem, as may be the case with the Virginia Bunch variety. On account of their high oil content, Red Spanish kernels are frequently used for the oil trade, but they are also used for the manufacture of peanut paste and are consumed as salted and devilled kernels.

Plate 127.
Close View of Cutter Attached to Tractor.

Planting.

The planting season extends from October to January, inclusive, the later date of planting being usual in the north. Peanut planters and maize drills fitted with special peanut plates operate in a very satisfactory manner for planting. These mechanical planters plant shelled seed only, and with them even-graded seed is necessary to ensure the fairly regular spacing of plants. Small areas may also be planted by hand in shallow furrows opened at the desired spacing of the rows. When planting is done by hand, the use of shelled seed is not essential. The whole pod or the pod broken in halves may, therefore, be used, but the germination is slower than is the case with shelled seed. Soaking of the pods prior to planting may prove to be advantageous.

A width of 36 inches between rows and a plant spacing of from 10 to 15 inches is recommended for the Virginia Bunch variety, this spacing requiring approximately 30 lb. of seed per acre. For the Red Spanish variety, a width of from 30 to 36 inches between the rows with a plant spacing of from 6 to 10 inches in the row is recommended. The seed of the Red Spanish variety is smaller than that of the Virginia Bunch, and approximately 25 lb. per acre is therefore adequate for the closer spacing usually adopted in the case of the former variety. The seed should be sown at a depth of 2 to 3 inches.

The treatment of Virginia Bunch seed with Ceresan, Agrosan, or similar organic mercury dusts, is very desirable in order to ensure a more satisfactory germination. Crown rot is not entirely prevented by seed treatment and it is a common practice to increase planting rates by as much as 25 per cent. of those recommended in order to provide for seedling losses.

Cultivation of the Crop.

Crop cultivation for the first month after planting may be carried out with light peanut harrows dragged across the rows. Ordinary light lever harrows may also be used. The initial harrowing

Plate 128.
Stooked Peanuts Drying in the Field.

may be done shortly after the plants appear, and the judicious use of the harrows in this early stage of the growth of the crop considerably reduces later hand work, since harrowing eradicates many weeds in the row. Inter-row cultivation should be continued until the first pods are developing. At least one hand chipping will probably be necessary to ensure the eradication of weeds. During the last cultivation a slight hilling is frequently given with the object of providing a free entrance for the fruiting pegs.

Harvesting and Marketing.

As the peanut crop does not mature evenly, harvesting is carried out when the majority of the pods are mature. The plants at that stage usually develop a yellowing of the foliage, but as that is not invariably the case an examination of the pods is necessary before a decision is

made to harvest the crop. The inside of the shell usually begins to colour, at least at one end, and shows darkened veins when maturity has been reached. In the case of the Virginia Bunch variety, a few of the early pods are usually lost, but no difficulty in this respect is experienced with the Red Spanish variety, which retains its pods for a considerable period after they have reached maturity.

Although several machines have been developed to cut, pull and deposit peanut plants in bundles in readiness for stooking, none has so far proved entirely satisfactory, and the bulk of the crop is hand-harvested.

Prior to pulling, the tap root is usually cut by means of specially designed cutting blades, adjusted to cut just below the level of the peanuts in the soil. A slight tilt of the cutting blades loosens the soil around the plants and thereby facilitates pulling. Cutters are generally attached in pairs on tractors (Plates 126 and 127), but small areas may be cut by single cutters attached to horse-drawn cultivators. Though rarely used in the main peanut-growing areas, a single furrow mouldboard plough with the mouldboard removed will act as a satisfactory cutter, but the attachment of a special share with an extended blade improves the cutting.

Plate 129.
THRESHING PEANUTS IN THE FIELD.

After cutting, the plants are pulled by hand and placed in bundles of a size convenient for handling when stooking, the soil being simultaneously shaken from the plants.

The usual practice is to stook the plants without support. The plants from eight to twelve rows are generally placed in a single line of stooks, the average size of the stooks being about 36 inches in diameter and 42 inches in height (Plate 128). The first plants are placed on the ground with the pods upwards, followed by some other outer plants with the pods towards the centre. The stooks can then be built in successive layers, each bundle of plants being firmly placed in position with the pods always to the centre of the stook. The last 12 inches are tapered to a point and capped by a plant with the foliage directed downwards with the object of shedding as much rain as possible.

Stacking around poles is occasionally adopted in Queensland for curing the crop prior to threshing. For that purpose, poles about 7 feet long are driven firmly into the ground and two cross-pieces 3 feet long are nailed on to the poles at right angles to each other about 9 inches from the ground. The first plants are placed on these cross-pieces in order to keep the pods off the ground, and the stack is then built round the pole with the pods inside. Towards the top of the pole the plants are so arranged as gradually to taper off the stook, which is capped by using inverted peanut plants or grass. From twenty to thirty poles are required per acre for curing the crop in this manner.

Dry weather is essential for the first week after pulling, in order to allow the plants to dry, but after that period has elapsed rain damage is usually of minor importance, unless continued for long periods. Unfavourable harvesting weather produces a darkening of the pods, and moulds may develop under such conditions, with a consequent loss of quality, and they may even cause the destruction of a large percentage of the crop.

Plate 130.
THE PEANUT SILOS AT KINGAROY.

The peanut plants may remain in the stooks for a period of from 14 to 28 days, the duration of the period depending on the prevailing weather conditions. The plants must be dry and the pods must shatter easily from the pegs before threshing is attempted. Threshing is usually done by contractors who operate machines designed for handling this crop (Plate 129). The stooks are generally conveyed on low wagons to the thresher, which is moved from time to time to convenient positions in the field. The plant residue, after the thresher has removed the pods, is frequently stacked in the field in the position in which it is delivered from the threshing machine, and is subsequently used as fodder.

The Queensland Peanut Board, which was established in 1924, is associated with the marketing of this crop. The Board has erected and controls extensive silos, shelling and cleaning machinery, and other equipment. The main storage facilities are provided at Kingaroy (Plate 130), but there are also Board depôts at Brisbane, Atherton, and Rockhampton.

Land Utilization.

P. J. SKERMAN, Agricultural Resources Officer, Bureau of Investigation.*

QUEENSLAND is fortunate in the possession of a wealth of land resources of sufficient variety to provide for every field of Australian agriculture. Some of these resources have been tapped, but each can be more intensively developed under a sound system of land utilization.

Older countries of the world have learnt to conserve their natural resources. The newer countries—America, South Africa, and Australia—taken generally, are only now beginning to realize the potential wealth to be found in a continually-fertile soil.

Queensland is a State with a brief history, yet there is already plenty of evidence of misuse of land in the past by destruction of forest areas, over-grazing, single crop farming, over-cultivation of sloping land, and indiscriminate burning-off. In far-northern areas some of our finest cabinet timbers have been felled and burnt to make way for dairying. At one time there was little demand for this timber, but in any further opening of land natural timber stands must be adequately considered.

A decision has to be made between forestry and dairying, keeping in mind the erosion hazard on sloping country. Over-grazing by domestic livestock, rabbits, and marsupials, particularly during droughts, has seriously reduced the carrying capacity of pastoral land; single crop farming has reduced the fertility of agricultural lands; and over-cultivation of sloping land, especially in the Darling Downs and Burnett districts, has increased the erosion problem. Regular burning-off is reducing the soil supply of humus, both on wheatlands and coastal grazing areas. The debt structure of the farm has often caused a farmer to abuse his land against his better judgment.

Land utilization is conditioned by climate, soil, water facilities for stock and irrigation, transport, markets, and land tenure. Each type of plant, each species of stock, has its climatic range. To-day, as a result of the efforts of plant-breeders, we have the means whereby the climatic range of plants can be widened by breeding and selection. In this way, wheat-growing has been taken right into the Arctic Circle. Fortunately for us, our tropical North, the sub-tropics, and a temperate climate in the fruit growing area of the Granite Belt put Queensland in the position climatically to become almost self-sufficient in respect of primary production.

Markets present a major problem and must be considered in discussing land utilization. Many of our commodity markets are saturated—we probably cannot economically increase our output of sugar; dairy products and wool will meet stern competition from substitutes; rice production and dried fruits have become the prerogative of southern States. Hence meat, cotton, tobacco, timber, canned tropical fruit, and grain-growing at present offer the best prospects. Adequate transport of produce by road or rail must also be considered.

* In a broadcast talk.

Soil Surveys.

Having decided upon possible crops, it is then necessary to determine whether they can be grown, and herein lies the importance of soil types within a climatic range. It is now realized that a comprehensive soil survey is basic for intelligent land utilization.

After World War I the Murrumbidgee Irrigation Area was opened for settlement without a preliminary soil survey. Later, it was found that its yield of citrus fruits was seriously declining, and a survey conducted in 1940 showed that of 6,000 acres of citrus only 53 per cent. of the trees were healthy, 25 per cent. were slightly unhealthy, and 22 per cent. were very unhealthy. The outstanding cause was excessive soil moisture associated with root decay caused by poor underdrainage of the heavy soils. Drainage is always costly, and the position was aggravated by the proximity of the citrus areas to the heavily irrigated rice-fields.

Through the efforts of the Council for Scientific and Industrial Research and State officers with detailed soil surveys, studies in irrigation methods, drainage layout, tree-health, combined with an overall aerial survey, the Murrumbidgee Irrigation Area is now the most intensely studied and best understood agricultural region in Australia. A land-use map has been drawn up for future development of the area, and an endeavour is being made to switch unsuitable citrus areas over to pasture.

The lesson to be learned here is that it would have been well worth while to conduct some of these investigations before opening the land for settlement.

Water Supply.

The recent drought conditions within this State have again focussed public attention on water. Land cannot be utilized without an adequate supply of water for domestic and stock purposes, and it can be more intensely farmed if a source of water for irrigation is available. Unfortunately, over a large portion of the State provision of water is the most difficult single problem. Some of our best pastoral land in Queensland remains under-developed because of the lack of adequate water supplies.

The destruction of prickly pear by the cactoblastis caterpillar gave Queensland back its great belt of brigalow country. This area has unsatisfactory underground water, and surface catchments are frequently failures. As a considerable area of this country is involved in soldier settlement schemes, the Government is wisely conducting hydrological investigations before opening areas for settlement. For irrigation settlement it is necessary to know water storage sites, capacities, water quality, areas capable of being watered, irrigation layout, and costs of water, in addition to the likely reaction of the soils to continuous watering.

Living Area.

A question which has arisen time and again is that of living areas, and it is important that careful consideration be given to this matter, keeping in mind the aim of permanent agriculture. The man with a small area may be inclined to overstock and overcrop in an endeavour to secure a reasonable living, with consequent deterioration in the fertility of the land. Short term leases and tenant farming may act in a similar

way. The recent *Agricultural Holdings Act* of New South Wales provides for landlord-tenant relationships whereby the fertility of the land is protected.

Rural Amenities.

Finally, the provision of rural amenities such as adequate educational facilities, modern hospitals, rural electrification, and library services will help to consummate the foregoing efforts towards full utilization of the land.

Planning for the Future.

The Queensland Bureau of Investigation set up under *The Land and Water Resources Development Act of* 1943 is charged with the simultaneous development of the land and water resources of the State, and to evolve a plan whereby those resources will be utilized to the fullest possible extent and with the greatest efficiency. Composed as it is of representatives of each department concerned with the State's land and water resources, its technical officers have access to the results of all the investigations which have been carried out in connection with any lands under consideration, as well as the results of the experimental work of the Department of Agriculture and Stock. With this collated information as a basis, additional investigations are proceeding whereby the full potentiality of any particular area can be assessed. Recommendations will then be made by the Bureau to have the land put to its fullest use.

Plate 131.

Stacking Grass Hay on Mount Hutton, Injune, near Roma.—This hay was the second cut from the same paddock, and was taken off six weeks after a 90-point storm. The hay proved to be of excellent quality, relished by both cattle and horses. Cows milked well on it and working horses kept their condition during this year's severe drought.

The 1946 Burdekin Flood.

W. J. S. SLOAN.*

ALTHOUGH it is difficult to give accurate details of flood and cyclone damage, sufficient data are available to indicate that the aggregate losses suffered by cane farmers generally of the Lower Burdekin were less in 1946 than in the 1940 flood (see *Cane Growers' Quarterly Bulletin,* July, 1940, October, 1940, and July, 1941). The flood waters were higher in some places and lower in others, but the overall picture shows that the level was lower in 1946, although the water remained over the banks many hours longer. The warning stations up-river and the timely broadcasts concerning changes in the river levels were valuable in forewarning interested communities of the expected flood and no doubt made a vital contribution to the welfare of affected districts by avoiding loss of life and minimising property damage. However, the supply position in respect of building materials and replacements for lost or damaged equipment is very unsatisfactory and has added greatly to the difficulties of farmers endeavouring to restore their properties to working order again.

Plate 132.

SEVERE EROSION ALONG HEADLAND EXTENDING INTO STANDING CANE.

The most serious breaks in the river banks were chiefly those which figured in the 1940 flood. Damage to cane crops was not as great as initial estimates indicated but the decrease in sugar produced in the Lower Burdekin from direct and indirect effects of the flood and cyclone is predicted by local observers to be in the vicinity of 20 per cent. Cyclonic winds flattened much cane, particularly in early planted fields which had six feet or more of cane at the time, but there were few extensive areas of broken sticks, and fortunately, lodged cane later recovered very well. Because of the comparatively long immersion of the cane, some shooting of eyes and roots occurred and death of the growing point was caused by silting in some cases. Patches of cane in low lying and poorly drained areas died out completely.

* In *The Cane Growers' Quarterly Bulletin* (Bureau of Sugar Experiment Stations, Department of Agriculture and Stock, Queensland) for July, 1946.

Deposits of sand and silt to depths of up to eight feet were left both in standing cane and on fallow fields. Not all deposits were harmful and a few fields were enriched by a layer of fertile silt. Curiously enough, occasional fields which were seriously eroded in 1940 received a useful layer of silt this time. Scooping and levelling are expected to reclaim for profitable cane growing most of the areas affected by sand deposits.

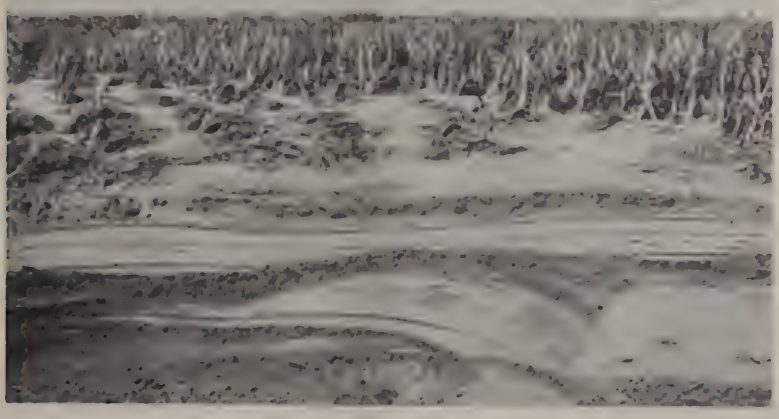


Plate 133.

CANE PARTLY BURIED BY SAND DEPOSITS. SCOOPING IN PROGRESS ON ADJACENT FALLOW FIELD IN FOREGROUND.

Plate 134.

HEAVY DEPOSIT OF FERTILE SILT ON A FALLOW FIELD.

The extent of sand deposits in standing cane cannot be accurately gauged but in many fields the indirect loss brought about by the blocking of irrigation furrows is considerable. Thus a large area will have to depend on natural rainfall until harvest and unfortunately droughty conditions followed the flood.

Many pumping plants were submerged and coated with silt; damage to these and overhead fluming was extensive. In several instances, the rise in the underground water level in wells temporarily put irrigation pumps out of action.

Flood effects are always more serious in furrow-irrigated areas, because levelling and grading are required to remake the fields suitable for irrigation. Following the 1940 Burdekin flood, certain recommendations were made and works carried out for the primary purpose of protecting the river banks and minimising the scouring effect of flood waters. Furthermore, a Burdekin River Trust was created. The duties of this authority were to maintain and carry out additions to protective works constructed along the river banks, in accordance with instructions from the Co-ordinator-General of Public Works. It was also empowered to plant and maintain various species of soil-binding plants along the river bank.

Plate 135.

RIVER SIDE OF A BULKHEAD SHOWING DEAD DURANTA AND CLERODENDRON, WHICH HELPED THE DEPOSITIONS OF SILT.

Protective works which were constructed comprised timber bulkheads and earth levees, located at selected weak places in the river banks. The protection of the river bank by planting grasses, shrubs and trees to provide a dense vegetative cover over a strip one and a-half to two chains wide on each side of the river along 29 miles of the danger area, particularly around low portions of the river bank, was strongly recommended. The voluntary co-operation of farmers was sought, firstly in regard to ceasing the practice of cultivating to the edge of the river bank, and secondly in recognising the need for not ploughing out any volunteer ratoon cane, until after mid-April, within five chains of the river bank reserve where such land was to be prepared for planting.

The object in constructing permanent bulkheads was to induce silting of the gullies at the low points adjacent to the river banks by checking the flow of flood waters. These were to serve primarily as a safeguard in times of high flood until such time as heavy vegetative cover had been established both in front of and behind the bulkhead

for prevention of any scouring. In the 1946 flood some of the bulkheads were destroyed while others completely withstood the flood. In any case the bulkheads all gave some relief and appeared to be effective except where a fresh break occurred at the end.

Plate 136.

New Erosion Caused by a Fresh Break Around the End of a Bulkhead.

It has been suggested by local residents that trees and vegetation growing in the river bed impede the flood waters. Thus the rate of discharge of the river is checked, flood waters tend to build up and be diverted towards the banks while the sand deposits around the tree growth in the river are gradually raising portions of the river bed. Such being the case it is not unlikely that each high flood will form a series of new breaks in the river banks until such time as the latter are adequately protected with a dense cover of suitable vegetation.

A considerable amount of work has been done in planting and establishing soil binding plants along the river bank but much remains to be done. In the early phase of reconstruction work after the 1940 flood, *Duranta* hedge was planted freely but later was replaced by the shrub *Clerodendron* because of the superior drought resistance of the latter. Guinea grass was a satisfactory cover in places, but where the water flow was fast its shallow rooting system was torn out of the ground and the flood waters then commenced to scour a deeper hole where the plant had been. Giant bamboo which had been established only a few years exhibited a similar weakness. However, this plant when well established should be excellent for the purpose of slowing down flood waters and preventing excessive erosion of the banks.

The Trust intends to plant tamarind trees extensively, for they possess a good rooting system and stand up well to dry conditions. Among other trees for trial is black bean, which has given good results on the Haughton River at Giru. Para grass, a common fodder grass grown around swamps and along the banks of creeks in many parts of Queensland, has also shown promise for controlling stream bank

erosion, because it flattens on the ground and protects the soil as the water passes over it. Elephant grass, a vigorous, hardy, tall growing grass, may also prove to be valuable as a soil retaining plant.

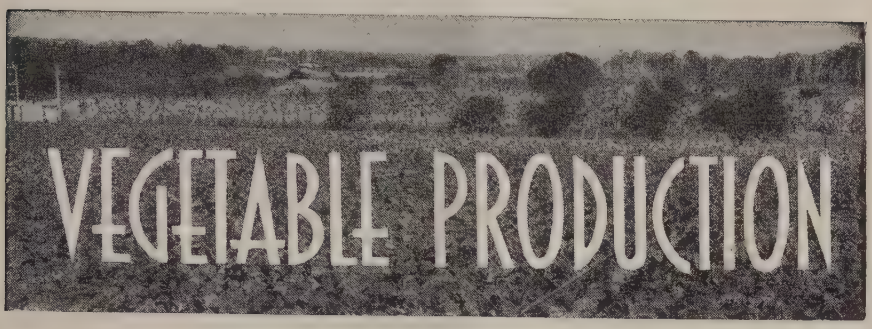
Experience during the recent flood clearly showed that revegetation needs to be done thoroughly over a substantial area of the bank. In one instance natural plant cover over one chain between the bank and the edge of the cultivation was insufficient to prevent scouring in the latter. The tendency still shown by some farmers to disregard the warning not to cultivate right to the edge of the bank is regrettable. In practically every case where a break occurred, ploughing in this manner was responsible. Unfortunately, in a number of these cases it was a neighbouring farmer who suffered the greater damage.

Although the 1946 flood occurred earlier than that in 1940, a large amount of land had been ploughed just prior to the flood and losses on some farms were heavy. Once again the retaining properties of a grass cover were plain to observe on the few areas which had not been ploughed. The inconvenience and perhaps loss of crop associated with late preparation and late planting are realised, but are unquestionably a small price to pay for the protection of cultivated land directly threatened by flood erosion which, even if not disastrous, may prove costly to repair.

Plate 137.

DEEP HOLE IN RIVER END OF CANE FIELD WHERE FLOOD WATERS BROKE THROUGH.—Bank on right was held together by molasses seepage from a mill drain.

The flood of 1946 caused much soil erosion which could otherwise have been avoided had those concerned fully appreciated the precautionary measures required. Any project to combat soil erosion needs the wholehearted and sincere co-operation of all members of the community in the affected area, to achieve any considerable measure of success. One section alone cannot solve the problem. Negligence on the part of a small number of farmers situated along vital portions of the river bank may menace many.



Cabbage-Growing.

C. N. MORGAN, Senior Adviser in Horticulture.

CABBAGE is among the more important vegetables required for the domestic market. It is adapted naturally to cool climates and is, therefore, more favoured as a winter crop in Queensland. However, by the selection of suitable varieties, the season of production may be extended. Normally summer production is confined to the regions of high altitude in the southern portion of the State, notably around Stanthorpe. In the coastal districts production during the hot months of the year was formerly fairly difficult owing chiefly to the lack of satisfactory pest control methods. With the advent of D.D.T., however, this problem is not serious; and, therefore, it should be possible to produce sufficient cabbage for Queensland requirements practically the whole year round.

Seed-beds.

The seed should be sown in beds of well-drained, deeply and thoroughly worked soil. Seed-beds should not be too rich; otherwise the young plants find their food too easily, do not develop a good root system, and are soft and may not be easily transplanted. If, on the other hand, the soil is very poor, a small quantity of fertilizer may be added to it about a week before sowing the seeds.

After raking the surface of the bed to make it smooth, it should be firmed with a flat board, and the seed then sown thinly in shallow drills, not more than $\frac{1}{2}$-inch in depth and about 4 inches apart. After sowing the seed, the surface of the bed should be mulched with well-rotted leaf mould or old manure, or covered with bags, in order to retain the moisture in the soil; this is necessary for the germination of the seed. If the beds are covered with bags care should be taken to remove them immediately the young plants begin to show.

Germination of cabbage seed is particularly quick. The young seedlings will appear in from three to four days in warm weather but will take considerably longer during colder months, probably from two to three weeks. Approximately 6-8 oz. of seed should be ample to provide enough cabbage plants for one acre.

Seed-beds should be watered regularly, otherwise the growth of the young seedlings will be checked, resulting in unsatisfactory plants. When large enough to handle, the seedlings may be thinned, if desired, to about half an inch apart; if they are grown too thickly, they develop into long, spindly, weak plants.

If it is very hot during the middle of the day, shading may be necessary, but this shade should be removed entirely as soon as the plants are strong enough to withstand the heat. Over-shading also produces long, spindly plants, which are soft and difficult to transplant.

Transplanting.

In from three to six weeks, according to the time of the year, the young plants should be large enough for transplanting. About a day or two before transplanting they should be hardened off, by withholding water. Immediately before transplanting, however, the plants may be given a good watering, as this will facilitate their removal from the seed-bed without excessive injury to the young rootlets. For preference, transplanting should be done during cloudy or showery weather. If weather conditions are unfavourable the young seedlings should be watered in; and, as a further precaution, particularly if the plants are fairly large, the top half of the leaves may be cut off to lessen evaporation of moisture from the plants until the new root system is firmly established. At all times during transplanting the roots of the young plants should be kept damp, and this may be done by standing the plants in a bucket containing a puddle of soil and water or carrying them in containers which allow the plants to be covered with wet bags.

In planting, a hole is first made in the ground, usually by a small hoe or by hand, and this should be deep enough to allow the roots of the seedling to reach the bottom. A little earth is turned in and the plant then drawn slightly upwards before pressing the soil firmly around it. This ensures that the main root is not doubled up.

If irrigating, the rows should be not less than 2 ft. 6 in. apart and the plants set out at least 1 ft. 6 in. apart in the row. Without irrigation, planting a little wider is recommended.

Fertilizing.

The application of chemical and organic fertilizers will do much to ensure quick and successful growth of cabbage, and there are a number of commercial mixtures of complete fertilizers on the market which have proved satisfactory for cabbage growing. A mixture with a formula in the vicinity of 5-12-5, and containing a fair proportion of organic matter such as blood and bone, is recommended for use as a basal dressing.

Whilst the rate of application of fertilizers varies in different districts, and actually on different farms—each experienced grower having his own views on the matter—as a general guide 10 cwt. to 15 cwt. to the acre may be applied. The method of application is to broadcast along the lines where it is intended the rows of cabbage shall be, and to scuffle the fertilizer in a week or more before planting. Blood and bone fertilizer is most popular in some districts as a base dressing.

If considered necessary, after about 4-6 weeks' growth, a side dressing of from 8-10 cwt. to the acre of a quick-acting complete fertilizer with a formula somewhat similar to that used for the basal dressing may be given. At hearting, a dressing of 2-3 cwt. of sulphate of ammonia or nitrate of soda will also be of considerable advantage.

For successful cropping, cabbage should be grown quickly. Therefore, on no account should growth be allowed to be checked. It is only possible to ensure continuance of growth by regular cultivation, watering when the weather is dry, and taking care that the plants do not lack an ample food supply.

Varieties.

Selection of the right varieties for different times of the year is important. In coastal districts, winter-planted types should be early and quick maturing. Seed of the early varieties is sown in the autumn, but the main crop varieties should be sown to allow planting out from June to August. Early coastal seed planting may be done during December and early January. In the Stanthorpe area seed may be sown from early spring to December.

Recommended varieties are:—

Early:—Early All Head, Early Drumhead, Henderson's Succession, and Select Succession.

All of these varieties are large, early, and quick growers.

Main Crop:—All Seasons and Succession.

The latter is a most popular variety, and may be grown at almost any time of the year and in practically every district; it is a good, large Drumhead type.

Drumhead is also a good variety; it is hardy, slightly larger than Succession, and matures a few weeks later.

Marketing.

Cabbage should be marketed as soon as practicable after cutting, and only good firm-hearted heads should be sent in. Care in handling is essential, and when placed in bags for railing at least some of the older outside leaves should be allowed to remain, as protection for the hearts against bruising, and the heads should be packed in the bags as firmly as possible.

ANSWERS.

(Selected from the outgoing mail of the Government Botanist.)

Red Natal Grass.

G.A.C. (Bell)—

The specimen is Red Natal Grass (*Rhynchelytrum repens*). This grass was introduced many years ago as a fodder by the Queensland Acclimatisation Society, and is now very widely spread in the coastal parts of the State. It is especially abundant along railway embankments and in old cultivation areas. It is not very closely allied to Rhodes Grass and is not a particularly good fodder. In coastal Queensland it is a fairly common weed of cultivation, especially on fruit farms, where it is used as a "chop-chop" for working horses and for cattle.

"Castor Oil" Plant.

Inquirer (Warwick)—

The specimen is *Datura ferox*, a plant closely allied to the common Stramonium. It is miscalled "Castor Oil" on the Darling Downs and parts of Western Queensland. The plant is supposed to be a native of Southern Europe, and first made its appearance in Queensland about Macalister twenty odd years ago. It has spread slowly, but has never become the common pest that Stramonium or Thorn Apple has. Once it gets established in a locality, however, it has every possibility of becoming a serious pest, especially as it is poisonous to stock. Although this plant and the common Stramonium (*Datura stramonium*) are nearly always referred to as "Castor Oil" on the Darling Downs, the true castor oil of commerce is a different and much larger plant, which is naturalised in the coastal parts of the State.

PLANT PROTECTION

Seasonal Notes on the Control of Vegetable Diseases.

J. E. C. ABERDEEN, Plant Pathologist.

Tomatoes.

THE increased price of tomatoes after the Stanthorpe season finishes induces many growers in other districts to attempt to have fruit on the market at that time. To do this means a series of plantings into the field during the months of January and February. For many districts this is a very difficult period for tomato production, owing principally to the incidence of several forms of wilt and the high temperatures at that time.

The two main diseases concerned, bacterial wilt and Fusarium wilt, both persist in the soil and as a result no control by the use of sprays is possible. Bacterial wilt has rather striking symptoms, as a vigorous-looking plant wilts rapidly in one or two days without any warning signs. Fusarium wilt, however, usually produces a yellowing of the older leaves, and when the plant commences to wilt it is a much slower process than for bacterial wilt, sometimes extending over weeks. As nothing can be done to cure an infected plant, control of these diseases depends on the grower's forethought in the choice of varieties and planting site.

There is only one variety of tomato which shows any resistance to bacterial wilt and that is Sensation. It must be trellised, however, to obtain a reasonably-sized fruit and, though possessing an attractive marketing appearance, the internal fruit characteristics are not all that is to be desired. It must also be made clear here that the term "wilt-resistant" as applied to some varieties does not mean resistance to bacterial wilt. In most districts where bacterial wilt is present there is evidence that the disease is far more prevalent on the lower, moister types of soil, so plantings should be confined to the drier ridges. If this cannot be done, then it is recommended that planting into the field be delayed until at least April, because the disease does not affect the winter crops.

Fusarium wilt is present in the majority of soils of all tomato-growing areas and control depends almost entirely on the planting of wilt-resistant varieties in the first place. Actually this term "wilt-resistant" may be misleading, as none of the common varieties so listed is entirely resistant to Fusarium wilt. Though considerably more resistant than the old Chalk's Early Jewel, they may still show a percentage of the disease in the hotter months of the year. In addition to possessing some degree of wilt resistance, a heavy-leafed bush is required to prevent sunscald in the January plantings. Rutgers is probably the best variety for these earliest plantings, with Pearson and

Pritchard also very useful. It is advisable to keep Break o' Day and Red Marhio and those varieties with lighter foliage for planting after February.

Target spot may worry some growers by attacking plants in the seed-bed and in the field. The best preventive measure is regular use of a copper fungicide as either a spray or a dust.

Cabbage and Cauliflowers.

The disease most likely to appear on cabbages and cauliflowers is black rot and the control of this depends entirely on seed treatment. The method of seed treatment with heat, or corrosive sublimate, was discussed in detail in the September issue of this Journal in an article "Black rot and black leg of cabbage and cauliflower." Heavy rains early in 1946 were responsible for a widespread incidence of black rot, and as this may be repeated in the early part of 1947 the necessity for taking precautions to control the disease is re-emphasized now.

Downy mildew is not likely to appear in the seed-beds during the hotter months, but if such does happen then the use of a copper spray gives ready control.

Lettuce.

Septoria leaf spot is widespread on lettuce and will almost certainly appear during the summer. Fortunately, it is seldom a serious disease unless the plant growth has been retarded by unfavourable conditions. Hence, the most important point in raising healthy lettuce at this time of the year is to maintain a rapid and vigorous growth with the aid of ample moisture and good cultural methods.

Carrots.

Carrots are usually free from serious troubles, but there are several leaf diseases that may cause damage if rain is frequent. The reduction in yield is usually insignificant, but if marketing the carrots with tops the price may be adversely affected by the damaged leaf. Any of the copper sprays will control these troubles, but applications should be made in the early stages and discontinued during the last few weeks prior to harvesting to avoid discolouration of the tops.

Crown rot may appear in the warmer weather. This disease is very spasmodic and difficult to control. The first indication of its presence is a collapse of the leaves of the plant commencing with the oldest, and on examining them they are seen to be rotted off immediately at soil level. There is as yet no sure control of this disease, so the grower is advised to keep a close watch for its first appearance and then, if possible, avoid excessive moisture, particularly on the soil surface. More definite advice on this problem may be possible after further experimental work is completed in the near future.

HOME MADE RAIN GAUGES.

In the October *Journal* (p. 203) it was mentioned that rain-water collected in a home made rain gauge could be accurately measured in a graduated 1-inch measuring glass. Actually, the method of graduation given applies only where a 5-inch funnel has been used, and different graduations would have to be calculated for funnels of different sizes.

Maori Mite Control in Midsummer.

A. W. S. MAY, Assistant Entomologist.

MAORI mite, which renders large quantities of citrus fruit unfit for market or considerably lowers its market value, is an important pest each year. It is usual to associate a brown discolouration on the rind of fruits with the activity of this pest, but severe damage to leaf and twig growth may occur during periods of intense mite infestation.

The late winter application of a lime-sulphur spray, at the strength of 1 part of the commercial concentrate to 15 parts of water, is a necessary part of maori mite control measures and should always be used. The success of the treatment is dependent on the efficiency of spray application. Although this spray greatly reduces the over-wintering mite population, complete eradication is seldom achieved, since some of the over-wintering mites may survive the treatment and rapidly increase in numbers during spring. The time taken for this pest to complete its development is very brief, particularly during the midsummer months from early November onwards. Thus, even though an application of lime-sulphur has been made in late winter, growers may experience quite considerable injury to fruits during the summer period. This phenomenon is not uncommon in coastal districts where maori mite is of major importance each year, and it occurs, to a lesser extent, in inland areas.

The maori mite is extremely small and hardly visible to the naked eye. Heavy infestation with consequential severe losses at a later date may be taking place unknown to the grower unless he keeps a close watch on his trees during the summer months. The presence of this mite in considerable numbers does, however, produce a "dusty" appearance on the fruit owing to the very large numbers of cast skins on the rind. Once this is observed, control measures should be applied as soon as possible. Delay at this stage will result in severe fruit discolouration.

The difficulty of observing the mite populations on the trees before injury becomes noticeable does suggest that orchardists should adopt the practice of preventive spraying. For this purpose, control measures may be applied to all varieties of citrus between late November and mid-January, but preferably as early in this period as practicable. A late November or December application of the insecticide does not necessarily complete the seasonal campaign against maori mite and growers are advised to examine their trees carefully between mid-January and March for indications of a further build-up of this pest, particularly in the case of late maturing varieties.

A lime-sulphur spray gives effective control of the maori mite at the period mentioned. It should be applied where possible, but a certain degree of care is required when treatments are made during the mid-summer months. The spray strength should not exceed 1 in 35 during this period and cool weather should be chosen for spraying to obviate any risk of injury to fruit and foliage that might occur if temperatures are excessive. High midday temperatures are commonly associated with spray injury to the trees, particularly in the foliage and fruits exposed to the direct rays of the sun. Trees should not be sprayed if they are suffering from a lack of soil moisture. This difficulty can be overcome where irrigation is available, but in non-irrigated orchards it is advisable to postpone spraying until more favourable conditions prevail.

Growers may adopt the practice of using a 1:1 sulphur-lime dust if treatment is contemplated in the mid- or late-summer period, for not only is this material applied more easily than a lime-sulphur spray, but the risk of tree injury is reduced to an appreciable degree. However, less efficient control of the pest may be expected from this treatment. The risk of tree injury may also be reduced, and at the same time a higher degree of mite control obtained than is possible with a dust, by applying a wettable sulphur spray at this period.

The possible use of copper or oil sprays during late November may necessitate some modifications in the timing of measures designed for maori mite control. An interval of at least one month should elapse after the application of an oil spray before lime-sulphur and wettable sulphur sprays or sulphur dusts are applied. Again, lime-sulphur used soon after copper sprays may produce a dark stain on the trees, and it is advisable to allow at least one week between these treatments.

Although oil sprays and fumigation may check the development of maori mite, too much reliance should not be placed on their value. It is preferable to adopt a summer sulphur treatment designed primarily for maori mite control and so prevent the build-up of a population to levels at which rind damage becomes obvious. If the necessary precautions are taken in implementing this control measure, the problem of maori mite control can be solved.

Losses from Water Blister can be Avoided.

T. McKNIGHT, Assistant Pathologist.

DURING last summer water blister (soft rot) disease again caused serious wastage in Queensland pineapples in transit to southern markets.

Measures to avoid wastage from this disease are well understood, and recurring losses are a certain indication that a grower has either completely neglected, or has very carelessly attended to, the disposal of discarded tops, knobs, fruit, leaves and other trimmings. This refuse, in and around the packing shed, is the breeding ground of the water blister fungus. In summer the fungus rapidly rots this discarded material and at the same time forms countless numbers of spores on the surface which are carried in the air and enter the fruit during packing operations through abrasions and bruises on the sides and shoulders, through the stem end, and occasionally through the broken top. As a result of this infection, originating on the plantation, water blister develops in the fruit during transport.

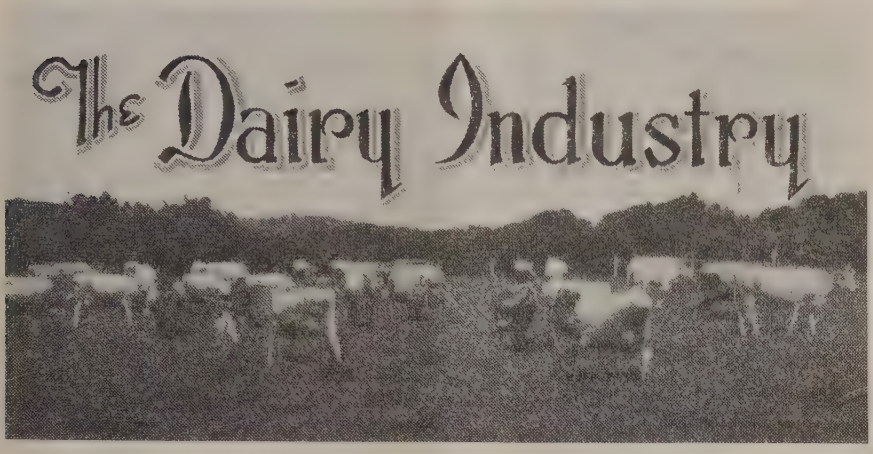
In their own interests, all growers are strongly urged to dispose of discarded pineapple material from in and around their packing sheds. Sheds should then be thoroughly sprayed with a 5 per cent. solution of formalin before the summer crop begins to ripen. From then on the disposal of discarded tops and other refuse should be carefully undertaken after every packing day.

Packing sheds with dirt floors should be sprayed with formalin at regular intervals, as these are difficult to keep free from infective material, particularly of knobs and leaf trimmings which rot and produce spores on the surface of the soil.

Finally, careful handling during picking and packing operations, and the rejection of cracked, sun-burned, "weeping" and "knobby" fruit are measures that must be adopted, as fruit with broken skin are highly susceptible to attack by the water blister fungus.

Plate 138.
ON THE ROAD TO BUNGIL BAY, NORTH QUEENSLAND.

Plate 139.
KAURI LOGS AT DANBULLA, NORTH QUEENSLAND.



Queensland Butter Production, 1945-46.

AS set out in the Annual Report of the Department of Agriculture and Stock for the year ended 30th June, 1946, the output of Queensland butter factories for last year was 101,242,498 lb., of an estimated value of £7,493,436. Although this production exceeded that of the previous year by 6,236,959 lb. the effect of adverse seasonal conditions and war-caused disabilities is clearly seen in the subjoined table showing butter production from 1938-39 to 1945-46:—

Year.	Tons.
1938-39	68,919
1939-40	62,408
1940-41	52,268
1941-42	42,712
1942-43	49,782
1943-44	45,275
1944-45	42,413
1945-46	45,197

With a decrease in the abnormal liquid milk requirements of recent years, because of the ending of the war and the withdrawal of service personnel from Queensland, the easing of labour disabilities on dairy farms and an improvement in the machinery and equipment supply position, butter production should gradually return to its pre-war level.

The average payout to suppliers by Queensland factories in recent years has been:—

Year.	Commercial Butter. Per lb. s.	d.
1938-39	1	1.55
1939-40	1	2·02
1940-41	1	1.88
1941-42	1	1·63
1942-43	1	3·9
1943-44	1	6·8
1944-45	1	7·9
1945-46	1	7·9

A departure has been made in the method of allocation of Commonwealth Government subsidy. As from 1st April, 1946, the subsidy became payable on a flat rate in contrast with the "flush" and "non-flush" seasonal differential subsidy rates paid from 1st April, 1944, to 31st March, 1946.

The Commonwealth Government has approved a continuance of the subsidy to the dairying industry until 31st March, 1947, such subsidy being estimated to return dairy farmers 1s. 7½d. per lb. commercial butter equivalent at the factory for their produce. Details of this amount for commercial butter representing average farm costs, including transport of cream from the farm to the factory, are as follows:—

		Per lb.	
	d.	*s.*	*d.*
Farm working and maintenance costs ..			5·437
Depreciation	1·370		
Fuel (100 per cent., milking machines and motor vehicles)	1·052		
Repairs and replacements	0·487		
Fodder, seed, and fertilizer	0·956		
Rates and taxes	0·343		
Other costs	1·229		
	5·437		
Capital charges (interest)			3·663
Labour reward			10·400
Management allowance of 25s. per week for the farmer	1·108		
Workers' wages, including the farmer himself at award rate	9·292		
Average farm production cost		1	7·500

Of the total butter production 83·18 per cent. was officially examined by Commonwealth and State grading staffs.

Grading results were:—

	Boxes.		Per cent.
Choice grade	549,357	..	36·86
First grade	835,026	..	56·03
Second grade	92,439	..	6·21
Pastry grade	13,463	..	1·09

The subjoined table sets out the grading results in recent years:—

Year.	Grades.			
	Choice.	First.	Second.	Pastry.
	Per cent.	Per cent.	Per cent.	Per cent.
1938–39 } Export only ..	51·06	38·24	9·97	·73
1939–40 }	49·9	37·4	11·8	·97
1940–41 }	49·26	38·1	11·3	1·34
1941–42	52·51	41·11	5·77	·61
1942–43	54·94	39·94	4·68	·44
1943–44	52·0	43·0	5·0	..
1944–45	45·37	47·4	6·53	·7
1945–46	36·53	55·52	6·87	1·08

Butter quality showed a further decline. The abnormal incidence of weed-tainted butter was largely the cause of the deterioration in the year's gradings in comparison with those of the preceding season; nevertheless, the consistent downward tendency of recent years should be arrested now that the war is over and a more determined approach made to the problem of raising quality by all sections of the industry, particularly at the source of production. Given a raw product of the requisite quality, the well-equipped Queensland factories are capable of processing it into butter comparable in quality with that of any other country. The assured market now available until 1948, when the present Imperial contract expires, should not be viewed complacently; intensive competition both from the produce of other countries and from butter substitutes can be expected within the next few years.

Weeds on pasture lands, especially on the "scrub" lands, are causing concern to the butter industry because of their tainting effect on dairy produce. Taints of this nature are not diminished by existing factory processes. Studies aimed at reducing or eliminating the intensity of weed flavours in butter have been commenced in Queensland by the Council for Scientific and Industrial Research.

In the year under review streaky and mottle texture defects were prevalent in the butter output of some factories. The cause of the relatively high incidence of this condition has, however, not been clearly determined.

In the course of the year 100-box butter churns were installed in two Queensland factories. Previously the 40-box churn was the largest used. Four years ago an all-metal churn was installed in one factory, but the capacity of this type of churn, which at present does not exceed 2,000 lb., is likely to limit its installation in larger factories.

Field officers of the Division have continued to provide the liaison between the Dairy Research Branch and the factories so far as the operations of the butter improvement service are concerned. The Queensland Butter Board again contributed £1,000 as a grant towards this service, by means of which butter from all factories is regularly sampled and examined chemically and bacteriologically. Despite the inability to install new equipment in the last few years and, in fact, the difficulty of maintaining efficiently existing equipment, especially churns—the main contaminatory factor in a modern butter factory—the biological control of butter manufacture was, in the circumstances, well maintained. There has been, too, consistent progress in the control of the composition of butter in the six years since the butter improvement service was inaugurated, but some factories have not given this important economic aspect of manufacture the attention it warrants.

PRODUCTION, PAYMENTS, AND GRADINGS OF BUTTER IN QUEENSLAND, FOR THE YEAR ENDED 30TH JUNE, 1946.

Factory.		Manufacture and Payments in Lb.					Over-run.		Make Graded.
		Total.	Choice.	First.	Second.	Pastry.	Actual.	Paid.	Per Cent.
Atherton	Make	1,763,872	1,747,912	..	15,960	..	66,287	70,973	14·57
	Pay	1,768,558	1,754,538	..	14,020	..	3·90%	4·18%	
Bushy Creek	Make	28,052	16,578	11,474	..	..	316	304	..
	Pay	28,040	16,572	11,468	..	..	1·14%	1·10%	
Caboolture	Make	1,981,935	1,808,167	172,704	1,064	..	70,737	70,478	75·97
	Pay	1,981,676	1,838,047	138,800	4,829	..	3·70%	3·69%	
Eumundi	Make	2,017,713	1,871,679	146,034	..	..	56,726	55,912	88·63
	Pay	2,016,899	1,898,622	118,106	171	..	2·89%	2·85%	
Pomona	Make	1,286,420	1,210,857	75,563	..	..	32,323	32,134	95·78
	Pay	1,286,231	1,246,575	39,231	425	..	2·58%	2·56%	
Chinchilla	Make	1,778,964	1,245,172	323,736	207,592	2,464	34,279	34,819	96·62
	Pay	1,779,504	1,287,448	332,195	159,358	503	1·96%	2%	
Daintree	Make	118,865	118,820	45	..	..	2,724	3,191	29·87
	Pay	119,332	119,287	45	..	..	2·35%	2·75%	
Dayboro	Make	82,036	47,768	34,268	..	..	U/r. 294,578	U/r. 20,326	24·78
	Pay	362,783	319,509	43,274	..	..	..	..	
Toowoomba	Make	2,823,372	1,965,564	771,232	86,576	..	91,233	91,232	67·35
	Pay	2,823,371	1,965,985	774,604	82,782	..	3·34%	3·34%	
Clifton	Make	1,394,792	1,036,336	353,976	4,480	..	41,698	41,700	90·60
	Pay	1,394,794	1,033,983	357,037	3,774	..	3·08%	3·08%	

OFFICIAL GRADINGS IN BOXES.

Factory.	Boxes Submitted As Choice.	Grading Result.			Boxes Submitted as First.	Grading Result.			Boxes Submitted as Second.	Grading Result.		Pastry Quality.
		Choice.	First.	Second.		First.	Second.	Pastry.		Second.	Pastry.	
Atherton	4,307	4,307 100%	..	..	117	117 100%	..	..	264	264 100%	..	..
Bushy Creek ..	..	..	..	..	..	..	..	..	..	..	..	..
Caboolture ..	23,025	15,303 66·46%	7,722 33·54%	..	3,834	3,402 88·73%	432 11·27%	..	27	14 51·85%	13 49·15%	..
Eumundi	29,008	13,626 46·97%	15,382 53·03%	..	3,927	2,943 74·94%	984 25·06%	..	..	..	..	..
Pomona	20,345	15,923 78·26%	4,422 21·74%	..	1,658	1,393 84·02%	265 15·98%	..	..	..	..	..
Chinchilla	20,324	11,762 57·87%	8,531 41·98%	31 ·15%	6,609	6,116 92·54%	493 7·46%	..	3,761	3,305 87·88%	456 12·12%	.. ..
Daintree	..	..	..	..	634	..	605 95·43%	29 4·57%	..	..	..	..
Dayboro	..	..	..	..	..	..	..	..	..	..	..	..
Toowoomba ..	18,574	14,682 79·05%	3,892 20·95%	..	14,054	13,760 97·91%	294 2·09%	..	1,327	1,197 90·20%	130 9·8	..
Clifton	17,062	15,070 88·32%	1,946 11·41%	46 ·27%	7,209	7,173 99·50%	36 ·50%	..	80	80 100%	..	..

PRODUCTION, PAYMENTS, AND GRADINGS OF BUTTER IN QUEENSLAND, FOR THE YEAR ENDED 30TH JUNE, 1946—*continued.*

Factory.	Manufacture and Payments in Lb.						Over-run.		Make Graded.
		Total.	Choice.	First.	Second.	Pastry.	Actual.	Paid.	Per Cent.
Crow's Nest	Make	1,587,824	738,696	825,720	23,408	..	46,844	46,869	97·57
	Pay	1,587,849	737,977	827,028	22,844	..	3·04%	3·04%	
Dalby	Make	3,169,116	993,774	2,078,742	96,600	..	104,558	104,579	96·01
	Pay	3,169,137	990,587	2,096,739	81,811	..	3·41%	3·41%	
Goombungee	Make	1,950,312	1,041,264	908,320	728	..	59,104	59,096	100
	Pay	1,950,304	1,041,235	908,369	700	..	3·13%	3·12%	
Jandowae	Make	2,249,576	1,114,344	1,061,536	73,696	..	66,117	66,088	99·99
	Pay	2,249,547	1,114,539	1,061,651	73,357	..	3·03%	3·03%	
Miles	Make	1,048,992	96,488	796,768	155,736	..	30,436	30,432	86·78
	Pay	1,048,988	96,226	796,912	155,850	..	2·99%	2·99%	
Esk	Make	2,301,372	1,094,823	1,093,311	113,238	..	74,276	74,472	96·54
	Pay	2,301,568	1,090,795	1,122,635	88,138	..	3·34%	3·34%	
Evolyn Tableland ..	Make	407,904	371,840	35,672	..	392	13,013	11,568	7·06
	Pay	406,459	401,179	4,502	778	..	3·30%	2·93%	
Gayndah	Make	1,282,540	852,796	365,008	64,736	..	46,588	46,925	79·05
	Pay	1,282,877	851,876	370,544	60,457	..	3·77 %	3·80%	
Killarney	Make	1,476,794	889,903	533,005	53,886	..	27,846	27,887	82·37
	Pay	1,476,835	761,691	651,542	63,602	..	1·92%	1·92%	
Logan and Albert ..	Make	3,427,792	2,854,352	573,440	..	..	126,028	125,299	94·74
	Pay	3,427,063	2,907,015	517,759	2,289	..	3·82%	3·79%	

OFFICIAL GRADINGS IN BOXES—*continued.*

Factory.	Boxes Submitted As Choice.	Grading Result.			Boxes Submitted as First.	Grading Result.			Boxes Submitted as Second.	Grading Result.		Pastry Quality.
		Choice.	First.	Second.		First.	Second.	Pastry.		Second.	Pastry.	
Crow's Nest ..	12,544	9,899 78·91%	2,645 21·09%	..	14,670	14,476 98·68%	194 1·32%	..	450	450 100%	..	..
Dalby	14,572	11,618 79·73%	2,954 20·27%	..	38,025	37,844 99·52%	181 ·48%	..	1,737	1,131 65·11%	606 34·89%	..
Goombungee ..	18,357	13,393 72·96%	4,964 27·04%	..	16,954	16,792 99·04%	162 ·96%	..	74	74 100%	..	..
Jandowae	19,615	10,919 55·67%	8,627 43·98%	69 ·35%	19,279	17,360 90·05%	1,919 9·95%	..	1,274	1,033 88·08%	241 18·92%	..
Miles	400	215 53·75%	185 46·25%	..	13,191	11,620 88·09%	1,571 11·91%	..	2,664	1,650 61·94%	1,014 38·06%	..
Esk..	18,398	12,617 68·58%	5,781 31·42%	..	19,390	18,823 97·08%	567 2·92%	..	1,888	1,588 84·11%	300 15·89%	..
Evelyn Tableland	429	241 56·18%	188 43·82%	..	85	85 100%	..	..	..	..	..	..
Gayndah	10,425	8,588 82·38%	1,837 17·62%	..	6,477	5,865 90·55%	612 9·45%	..	1,203	627 52·12%	576 47·88%	..
Killarney	8,826	6,373 72·21%	2,453 27·79%	..	11,790	11,645 98·77%	145 1·23%	..	1,106	1,106 100%	..	..
Logan and Albert	47,838	22,489 47·02%	25,283 52·84%	66 ·14%	10,152	8,005 78·85%	2,147 21·15%	..	..	..	..	..

PRODUCTION, PAYMENTS, AND GRADINGS OF BUTTER IN QUEENSLAND, FOR THE YEAR ENDED 30TH JUNE, 1946—*continued.*

Factory.	Manufacture and Payments in Lb.						Over-run.		Make Graded.
		Total.	Choice.	First.	Second.	Pastry.	Actual.	Paid.	Per Cent.
Maleny	Make	2,160,883	2,048,547	112,336	..	..	64,861	65,911	94·14
	Pay	2,161,933	2,091,921	69,424	588	..	3·09%	3·14%	
Biggenden	Make	1,627,284	1,173,684	453,600	..	..	44,481	44,120	81·00
	Pay	1,626,923	1,247,011	379,912	..	..	2·81%	2·79%	
Kingaroy	Make	3,770,332	3,260,652	324,880	184,800	..	139,048	138,415	50·86
	Pay	3,769,699	3,295,826	317,033	156,840	..	3·83%	3·81%	
Mundubbera	Make	2,096,652	1,764,180	217,504	14,968	..	82,713	82,322	82·83
	Pay	2,096,261	1,811,960	192,241	92,060	..	4·11%	4·09%	
Wondai	Make	2,291,910	1,586,565	633,640	71,705	..	78,456	78,851	78·42
	Pay	2,292,305	1,690,466	556,285	45,554	..	3·54%	3·56%	
Milmerran	Make	1,421,881	312,353	735,000	340,424	34,104	35,709	35,629	90·50
	Pay	1,421,801	368,749	755,205	297,847	..	2·58%	2·57%	
Nanango	Make	2,411,440	710,608	1,649,088	51,744	..	86,172	85,506	96·57
	Pay	2,410,774	957,077	1,419,397	34,300	..	3·71%	3·68%	
Oakey	Make	4,414,674	3,156,634	860,720	397,320	..	147,972	146,594	95·66
	Pay	4,413,296	3,216,004	885,259	312,033	..	3·47%	3·44%	
Bundaberg	Make	1,380,583	478,983	901,600	..	..	27,218	32,096	57·09
	Pay	1,385,461	446,447	938,046	945	23	2·01%	2·37%	
Gladstone	Make	935,025	136,355	770,527	28,143	..	19,341	19,713	62·42
	Pay	935,397	167,642	741,063	26,692	..	2·11%	2·15%	

OFFICIAL GRADINGS IN BOXES—*continued.*

Factory.	Boxes Submitted As Choice.	Grading Result.			Boxes Submitted as First.	Grading Result.			Boxes Submitted as Second.	Grading Result.		Pastry Quality.
		Choice.	First.	Second.		First.	Second.	Pastry.		Second.	Pastry.	
Maleny	33,756	23,617 69·96%	10,139 30·04%	..	2,571	2,410 93·74%	161 6·26%	..	..	..	..	..
Biggenden ..	15,256	8,900 58·34%	6,324 41·45%	32 ·21%	8,281	6,471 78·14%	1,790 21·62%	20 ·24%	..	..	..	..
Kingaroy	25,038	21,762 86·92%	3,276 13·08%	..	5,905	5,186 87·82%	719 12·18%	..	3,301	2,837 85·94%	464 14·06%	..
Mundubbera ..	25,085	13,143 52·39%	11,904 47·46%	38 ·15%	4,058	2,635 64·93%	1,423 35·07%	..	1,868	721 38·60%	1,147 61·40%	..
Wondai	19,729	16,179 82·01%	3,550 17·99%	..	11,155	10,060 90·18%	1,095 9·82%	..	1,211	998 82·41%	213 17·59%	..
Milmerran ..	3,380	1,909 56·48%	1,471 43·52%	..	12,903	12,211 94·64%	692 5·36%	..	6,652	5,217 78·43%	1,435 21·57%	43
Nanango	11,299	8,077 71·48%	3,222 28·52%	..	29,351	28,866 98·35%	485 1·65%	..	935	822 87·91%	113 12·09%	..
Oakey	50,922	29,408 57·75%	21,514 42·25%	..	17,398	17,275 99·29%	123 ·71%	..	7,093	7,093 100%	..	..
Bundaberg ..	867	647 74·63%	220 25·37%	..	13,207	12,689 96·08%	518 3·92%	..	..	..	..	..
Gladstone	344	315 91·57%	29 8·43%	..	9,854	9,854 100%	..	..	151	84 55·63%	67 44·37%	73

PRODUCTION PAYMENTS, AND GRADINGS OF BUTTER IN QUEENSLAND, FOR THE YEAR ENDED 30TH JUNE, 1946—*continued.*

Factory.	Manufacture and Payments in Lb.						Over-run.		Make Graded.
		Total.	Choice.	First.	Second.	Pastry.	Actual.	Paid.	Per Cent.
Monto	Make	3,383,701	1,267,387	1,999,166	117,148	..	54,521	65,570	92·69
	Pay	3,394,750	1,427,173	1,872,466	95,111	..	1·64%	1·97%	
Rockhampton	Make	1,206,409	147,985	924,889	133,535	..	11,362	14,645	13·24
	Pay	1,209,692	150,911	942,089	116,692	..	·95%	1·23%	
Wowan	Make	2,039,312	349,164	1,496,952	189,836	3,360	51,905	51,962	75·04
	Pay	2,039,369	350,324	1,509,322	179,723	..	2·61%	2·61%	
Biloela	Make	3,224,257	691,424	2,396,629	136,204	..	68,833	68,898	90·47
	Pay	3,224,322	677,267	2,430,409	116,646	..	2·18%	2·18%	
Q.A.H.S. and College ..	Make	72,960	44,400	27,608	952	..	1,189	1,219	39·45
	Pay	72,990	69,216	3,652	122	..	1·66%	1·70%	
Boonah	Make	3,917,121	1,566,664	2,082,705	261,200	6,552	134,763	134,620	92·59
	Pay	3,916,978	2,552,487	1,203,925	160,566	..	3·56%	3·56%	
Booval	Make	3,707,283	1,896,575	1,397,312	411,492	1,904	74,371	75,631	70·41
	Pay	3,708,543	2,022,339	1,360,963	325,241	..	2·05%	2·08%	
Grantham	Make	2,505,281	1,065,044	1,146,977	287,828	5,432	74,642	74,595	91·95
	Pay	2,505,234	1,368,321	912,068	224,845	..	3·07%	3·07%	
Laidley	Make	1,983,983	1,105,890	736,104	140,253	1,436	69,601	69,657	96·37
	Pay	1,984,040	1,232,613	639,324	112,103	..	3·64%	3·64%	
Lowood	Make	915,970	245,430	606,482	59,354	4,704	24,477	24,434	94·24
	Pay	915,927	264,370	603,199	48,358	..	2,75%	2·74%	

OFFICIAL GRADINGS IN BOXES—*continued.*

Factory.	Boxes Submitted As Choice.	Grading Result.			Boxes Submitted as First.	Grading Result.			Boxes Submitted as Second.	Grading Result.		Pastry Quality.
		Choice.	First.	Second.		First.	Second.	Pastry.		Second.	Pastry.	
Monto	16,461	13,574 82·46%	2,887 17·54%	..	35,896	35,877 99·95%	19 ·05%	..	2,155	1,873 86·91%	282 13·09%	28
Rockhampton ..	..	..	..	..	1,336	1,202 89·97%	134 10·03%	..	1,590	605 38·05%	985 61·95%	..
Wowan	2,533	1,577 62·26%	956 37·74%	..	21,603	20,811 96·33%	792 3·67%	..	3,262	1,523 46·69%	1,739 53·31%	..
Biloela	8,495	6,390 75·22%	2,105 24·78%	..	41,152	40,278 97·88%	874 2·12%	..	2,343	1,283 54·76%	1,060 45·24%	..
Q.A.H.S and College	4	..	4 100%	..	493	469 95·13%	24 4·87%	..	17	17 100%	..	..
Boonah	37,097	10,070 27·15%	26,961 72·68%	66 ·17%	24,120	21,832 90·51%	2,288 9·49%	..	3,545	3,113 87·81%	432 12·19%	..
Booval	18,348	11,969 65·23%	6,379 34·77%	..	22,137	20,708 93·54%	1,429 6·46%	..	6,126	5,756 93·96%	370 6·04%	..
Grantham ..	19,774	9,768 49·40%	10,006 50·60%	..	16,784	15,526 92·50%	1,222 7·28%	36 ·22%	4,577	4,455 97·33%	122 2·67%	..
Laidley	20,438	14,293 69·64%	6,145 30·36%	..	11,498	10,712 93·16%	786 6·84%	..	2,207	2,017 91·39%	190 8·61%	..
Lowood	3,824	2,461 64·36%	1,363 35·64%	..	10,706	10,164 94·94%	542 5·06%	..	885	732 82·71%	153 17·29%	..

PRODUCTION, PAYMENTS, AND GRADINGS OF BUTTER IN QUEENSLAND, FOR THE YEAR ENDED 30TH JUNE, 1946 *continued*.

Factory		Manufacture and Payments in Lb.					Over-run.		Make Graded
		Total.	Choice.	First.	Second.	Pastry.	Actual.	Paid.	Per Cent.
Roma	Make	637,209	..	437,155	200,144	..	19,152	19,152	47·89
	Pay	637,209	132,081	341,488	163,652	78	3·10%	3·10%	
Murgon	Make	2,378,429	1,582,467	791,034	4,928	..	75,537	74,869	83·59
	Pay	2,377,761	1,773,267	601,152	3,342	..	3·28%	3·25%	
Proston	Make	1,276,342	685,317	512,961	78,064	..	45,752	45,573	96·35
	Pay	1,276,163	746,590	462,791	66,782	..	3·72%	3·70%	
Kingston	Make	4,681,208	2,731,344	1,795,192	154,672	..	144,638	141,699	99·84
	Pay	4,678,869	2,906,610	1,657,454	114,805	..	3·17%	3·12%	
Woodford	Make	1,482,015	1,249,482	232,533	..	..	42,525	45,131	100
	Pay	1,484,621	1,278,156	206,465	..	..	2·95%	3·14%	
Allora	Make	1,604,456	1,116,666	479,524	8,266	..	38,008	38,445	83·65
	Pay	1,604,893	1,117,423	477,134	10,336	..	2·43%	2·45%	
Inglewood	Make	515,082	171,690	294,112	49,280	..	16,287	16,365	85·68
	Pay	515,160	150,377	319,726	45,057	..	3·27%	3·28%	
Mill Hill	Make	1,790,220	1,718,932	42,728	28,560	..	53,752	51,434	59·86
	Pay	1,787,902	1,203,087	551,494	33,321	..	3·09%	2·96%	
Texas	Make	181,379	122,101	23,805	35,473	..	6,738	6,711	32·91
	Pay	181,352	72,803	75,098	33,451	..	3·86%	3·84%	
Cooroy	Make	1,272,442	966,626	274,064	31,752	..	28,603	28,360	91·62
	Pay	1,272,199	1,046,745	209,002	16,452	..	2·30%	2·28%	

OFFICIAL GRADINGS IN BOXES—*continued.*

Factory.	Boxes Submitted As Choice.	Grading Result.			Boxes Submitted as First.	Grading Result.			Boxes Submitted as Second.	Grading Result.		Pastry Quality.
		Choice.	First.	Second.		First.	Second.	Pastry.		Second.	Pastry.	
Roma	..	..	..	..	1,902	1,860 97·79%	42 2·21%	..	3,548	3,516 99·10%	32 ·90%	..
Murgon	20,956	12,824 61·19%	8,132 38·81%	..	14,296	13,924 97·40%	372 2·60%	..	88	61 69·32%	27 30·68%	..
Proston	11,476	6,079 52·97%	5,397 47·03%	..	9,099	8,831 97·5%	268 2·95%	..	1,386	1,255 90·55%	131 9·45%	..
Kingston	48,337	35,511 73·47%	12,826 26·53%	..	30,653	30,422 99·25%	231 ·75%	..	2,690	2,588 96·21%	102 3·79%	..
Woodford	21,962	10,275 46·79%	11,687 53·21%	..	4,447	4,023 90·47%	424 9·53%	..	59	59 100%	..	..
Allora	13,649	6,326 46·35%	7,277 53·32%	46 ·33%	10,177	9,932 97·59%	245 2·41%	..	139	106 76·26%	33 23·74%	..
Inglewood ..	1,996	1,073 53·76%	856 42·89%	67 3·35%	5,014	5,014 100%	..	..	871	817 93·80%	54 6·20%	..
Mill Hill	16,163	14,577 90·19%	1,586 9·81%	..	2,437	2,437 100%	..	..	536	451 84·14%	85 15·86%	..
Texas	..	..	..	..	442	442 100%	..	..	624	537 86·06%	87 13·94%	..
Cooroy	14,921	11,769 78·88%	3,152 21·12%	..	5,347	5,005 93·60%	342 6·40%	..	550	530 96·36%	20 3·64%	..

PRODUCTION, PAYMENTS, AND GRADINGS OF BUTTER IN QUEENSLAND, FOR THE YEAR ENDED 30TH JUNE, 1946—*continued.*

Factory.	Manufacture and Payments in Lb.					Over-run.		Make Graded.
	Total.	Choice.	First.	Second.	Pastry.	Actual.	Paid.	Per Cent.
Gympie	Make 5,585,637	4,931,316	573,272	81,049	..	194,294	197,500	91·68
	Pay 5,588,843	5,122,921	402,918	63,004	..	3·57%	3·63	
Maryborough	Make 846,461	512,907	320,926	12,628	..	26,339	28,271	26·76
	Pay 848,393	567,622	267,067	13,704	..	3·21%	3·45%	
Millaa Millaa	Make 697,591	688,911	1,064	7,616	..	24,176	22,096	15·68
	Pay 695,511	687,698	..	7,813	..	3·59%	3·28%	
Mackay	Make 641,571	214,024	422,617	646	4,284	16,055	18,341	..
	Pay 643,857	208,557	430,340	697	4,263	2·57%	2·93%	
Silkwood	Make 7,182	..	7,182	..	..	180	188	..
	Pay 7,190	..	7,190	..	..	2·57%	2·68%	
Totals	Make 101,242,498	60,817,440	35,842,442	4,517,684	64,932	2,719,626	..	..
	Pay 101,547,523	63,895,747	33,913,042	3,733,867	4,867	..	3,018,155	

OFFICIAL GRADINGS IN BOXES—*continued.*

Factory.	Boxes Submitted As Choice.	Grading Result.			Boxes Submitted as First.	Grading Result.			Boxes Submitted as Second.	Grading Result.		Pastry Quality.
		Choice.	First.	Second.		First.	Second.	Pastry.		Second.	Pastry.	
Gympie	77,755	68,816 88·50%	8,939 11·50%	..	12,354	11,184 90·53%	1,170 9·47%	..	1,334	948 71·06%	386 28·94%	..
Maryborough ..	34	24 70·59%	10 29·41%	..	3,887	3,339 85·90%	523 13·46%	25 ·64%	124	10 8·06%	114 91·94%	..
Millaa Millaa ..	999	999 100%	..	..	829	829 100%	..	..	125	95 76·00%	30 24·00%	..
Mackay	..	..	..	..	..	..	..	..	..	..	..	..
Silkwood	..	..	..	..	..	..	..	..	..	..	..	..
Totals ..	824,947 ..	549,357 66·59%	275,129 33·36%	461 ·05%	589,347 ..	559,897 95·00%	29,340 4·98%	110 ·02%	75,847 ..	62,638 82·58%	13,209 17·42%	144 ..

Grading Results: Choice—549,357 boxes, 36·86%; First—835,026, 56·03%; Second, 92,439, 6·21%; Pastry, 13,463, ·9%.

CORRECTED YIELDS AND GRADES OF CHEESE FOR TWELVE MONTHS ENDED 30TH JUNE, 1946.

Factory	Milk Received	Production and Yield.						Gradings of Cheese.			
		Green Cheese Weight.	Butterfat.	Cheese. Per 100 Lb. Milk.	Yields. Per Lb. Butterfat.	Average Test.	Total Submitted.	Choice.	First.	Second.	Third.
	Lb.	Lb.	Lb.	Per cent.	Per cent.	Per cent.	Lb.				
Coalstoun Lakes	1,731,397	164,126	65,300	9·48	2·51	3·77	16,047	..	..	7,536	8,511
								..	..	46·96%	53·04%
Felton	6,117,051	674,779	244,538	11·03	2·76	3·64	371,315	..	328,464	42,851	
								..	88·46%	11·54%	
Highgrove	2,631,611	271,719	101,379	10·32	2·68	3·85	247,212	..	1,890	191,014	24,308
									·87%	87·94%	11·19%
Irongate	5,695,035	572,344	206,755	10·05	2·77	3·89	511,068	2,101	471,409	36,118	1,440
								·41%	92·24%	7·07%	·28%
Pittsworth	9,691,280	1,022,414	387,236	10·55	2·64	4	708,139	79,255	601,502	24,382	
								11·19%	85·37%	3·44%	
Brookstead	3,130,894	330,925	121,631	10·57	2·72	3·88	330,901	..	236,159	93,305	1,437
								..	71·37%	28·2 %	·43%
Linthorpe	4,975,044	515,295	193,861	10·23	2·63	3·90	397,689	..	198,917	195,757	3,015
								..	50·01%	49·23%	·76%
Scrubby Mountain	3,650,781	371,283	140,837	10·17	2·64	3·86	360,990	..	83,691	264,579	12,720
								..	23·18%	73·29%	3·53%
Springside	3,990,870	440,278	149,416	10·27	2·74	3·74	342,674	118,040	223,671	963	..
								34·45%	65·27%	·28%	..
Yarranlea	5,730,306	584,432	216,404	10·20	2·70	3·70	363,048	588	319,273	41,910	1,277
								·16%	87·94%	11·55%	·35%
Rockview	2,829,866	295,536	110,921	10·44	2·66	3·92	278,786	1,607	257,850	19,329	..
								·58%	92·49%	6·93%	..
Yamsion	3,708,299	425,047	150,179	11·46	2·83	4·05	399,183	..	209,218	185,403	4,562
								..	52·41%	46·45%	1·14%
Yargullen	4,321,884	459,805	167,644	10·61	2·71	3·88	344,800	..	305,222	39,114	464
								..	88·52%	11·34%	·14%
Maxam, Cooranga North ..	6,683,158	724,168	272,439	10·84	2·66	4·08	687,176	..	613,829	73,347	..
								..	89·33%	10·67%	..
Maryborough, Wondai ..	1,145,203	104,197	44,694	9·12	2·34	3·90	48,386	..	48,386	..	..
									100%		
Amended Totals	282,342,479	26,943,245	10,017,301	10·26	2·69	3·87	18,308,511	229,807	12,633,939	5,176,917	267,849
								1·26%	69·01%	28·28%	1·45%

ANIMAL HEALTH

Veterinary Medicines.

F. B. COLEMAN, Registrar of Veterinary Medicines.

VETERINARY medicines under "*The Veterinary Medicines Acts, 1933 to* 1938," include any mixture, compound, or preparation of one or more drugs r ingredients in any form or any biological products, including both living and ead vaccines, sera, and diagnostic agents intended to be administered to stock y any means:

(*a*) For the purpose of curing or alleviating any injury to stock,

(*b*) For the purpose of curing or preventing any disease of any stock,

(*c*) For the purpose of improving the condition of or increasing the capacity of any stock for work or production or show purposes.

The term does not include—

(i.) Any drug or drugs actually prescribed by a veterinary surgeon in the course of the practice of his profession as such,

(ii.) Any veterinary medicine or medicament or material supplied by a veterinary surgeon for any stock for the time being under his professional care or charge.

Every dealer in veterinary medicines must hold a license to sell such reparations. The prescribed license fee is 5s. which is payable in January f each year and/or when commencing business.

Before any veterinary medicine is placed upon the Queensland market, n application for registration must be made and such application renewed every nree years, i.e., 1948, 1951, &c., during the month of January. Registration fees re payable annually. No sales should take place until registration has been ffected.

Application for registration or renewal thereof involves the forwarding f a statutory declaration, setting out the formula of the preparation, ccompanied by a specimen label and sample, and the necessary fees, i.e., £1 1s. or the first preparation, and 5s. for each subsequent veterinary medicine, with maximum of £5 5s. per year. These applications are duly examined with espect to the Act's requirements and placed before the Veterinary Medicines Board—consisting of the Agricultural Chemist, the Chief Inspector of Stock, a acteriologist, and a veterinary surgeon.

The formulae, claims, and statements made are considered, and, if pproved, the veterinary medicine, upon completion of all the Act's requirements, s duly registered.

All labels are required to set out the following:—

(*a*) The distinctive name of the veterinary medicine;

(*b*) The net weight contained in the package, or, in the case of liquids the true volume content expressed in Imperial measure;

(*c*) In the case of any liquid veterinary medicine having or claiming to have germicidal and/or disinfecting properties, its bactericidal efficiency expressed in terms of absolute phenol (100 per cent.) as determined by the Rideal-Walker test;

(*d*) A printed statement giving quantity or proportion of any substance or substances prescribed in the Second Schedule of the Regulations;

(*e*) In the case of biological products, in addition to the other requirements of the Regulations, the date from which they should no longer be used; this must be expressed in the following manner:—

"Kept in a dark, cool place, this product remains fully potent until [*Here insert date*].

(*f*) The name and address of the Queensland primary dealer or manufacturer;

(*g*) All directions for use of the veterinary medicine;

(*h*) The following wording:—

"Registered under the *Queensland Veterinary Medicine Acts*";

(*i*) The word POISON when required.

All veterinary medicines containing *Carbon tetrachloride*, *Tetrachlorethylene*, *and Trichlorethylene*, must be labelled "Poison" and packed in the manner prescribed by Regulation 15 under the *Veterinary Medicines Acts*.

The word "POISON" should be in red letters on a white ground, in larger and heavier type than any other letter on the label; and no other words shall appear on the same line. No other letter on the label shall be in a red colour.

Farmers and other buyers would be well advised **never to accept delivery** of any veterinary medicine unless it has affixed to the package a plainly printed label setting out the required information.

In the absence of a label it is obvious that the buyer should at once communicate with the Standards Branch, Department of Agriculture, William Street, Brisbane.

The *Veterinary Medicines Acts* provide that no person shall affix any label to or use or issue with or in connection with any veterinary medicine offered for sale directions for use, or any printed, typed, or written matter, and/or advertisement which contains any statement or claim which directly or by implication indicates or suggests that it will prevent or cure the following diseases:—

Malignant growths (cancer), tuberculosis, or contagious abortion.

The veterinary medicines as set out in the following list are those that have been registered for the three-year period January, 1945, to December, 1947, under the above Acts. These and any published in subsequent lists are the only veterinary medicines that should be offered for sale or requested by prospective purchasers.

It should be noted that the sale of any unregistered veterinary medicine would render the seller liable to a penalty not exceeding £20.

Veterinary Medicines Registered for the period January, 1945, to December, 1947.

List No. 1 prepared on 19th July, 1946, and published in accordance with section 6 (7) of the Acts.

C.F. & Shirleys Fertilizers Ltd., Little Roma street, Brisbane.

Andrew Dryden's Diuretic Powders for Horses and Cattle.
Andrew Dryden's Embrocation.
Andrew Dryden's Gripe Drench.
Andrew Dryden's Wound Dressing for Horses and Cattle.
Andrew Dryden's Condition Powders for Horses and Cattle.
Dryden's Gall Cure.
Dryden's Invaluable Specific for Warts on Poultry.

mitstead, J., Chemist, Warwick.

Mawson's Sheep Tapeworm Drench.

stralian Chemical Co. Ltd., Donkin street, South Brisbane.

Acco Savol.

stralian Disinfectant Co., 150 Mary street, Brisbane.

Novama for Control of Vaginitis.
Safonia.
Wagstaff's Stock Drench.
Wagstaff's Embrocation.

aynes, J. H., 297 Ruthven street, Toowoomba.

Pro-Vet Antiseptic Capsules.
Pro-Vet Black Spot Application.
Pro-Vet Blighty.
Pro-Vet Bloat Draught.
Pro-Vet Bot Bombs.
Pro-Vet Calcium Drench.
Pro-Vet Condition Powder.
Pro-Vet Embrocation.
Pro-Vet Foot-Rot Paste.
Pro-Vet Laxative Drench.
Pro-Vet Mange Specific.
Pro-Vet Stock Drench (Concentrated).
Pro-Vet Physic Balls for Horses.
Pro-Vet Salve.
Pro-Vet Scour Treatment.
Pro-Vet Udderlin.
Pro-Vet Vaginitis Powder.
Vermort Sheep Drench.
Hamilton Mammitis Vaccine.
Pro-Vet Blackleggine.
Provet-ol.
Provetine.
Pro-Vet Hamilton Drench.

ickford & Sons Ltd. A. M., Tank street, Brisbane.

Radiol Leg Wash Powder.
Radiol Chemical Liquid.

ryce Ltd., 134 Adelaide street, Brisbane.

Pegasol.
Pegasus Blackleg Aggressin (Liquid).
Pegasus Mammitis Toxiculture.
Pegasus Stock Drench (Concentrated).
Pegasus Vaginitis Capsules.
Pegasus Worm Drench for Horses.

Butler & Co. Pty. Ltd., E., 432 Queen street, Brisbane.

Hagley's Hopple Chafe Specific.

Campbell Bros. Pty. Ltd., Campbell street, Bowen Hills, Brisbane.

Safa.

Carvosso, P. H., 28 Wienholt street, Auchenflower, Brisbane.

Chemco Dog Condition Powders.
Bot Capsule.

Dalgety & Co. Ltd., Elizabeth street, Brisbane.

Kerol.
Sayers Blu-Nik.

Davey, Mrs. M. E., Prospect street, Wynnum.

Moases Famous Antiseptic Disinfectant Deodorant.
Moases Famous Draught for Horse or Cow for Colic.
Moases Famous Drench for Cattle.
Moases Famous Eye Specific.
Moases Famous Liniment.

David, F. D., George street, Brisbane.

K Nine Puppy Worm Syrup.
K Nine Canker Lotion.
K Nine Nu Kote Mange Prescription.
Fleego Dog Soap.
David's Ear Canker Powder.
David's Worm Mixture for Grown Dogs.
Rid-O-Mange.

Dryden, V., 10 Fuller street, Lutwyche, Brisbane.

Gall Ointment.
Victor Dryden's Blood and Water Powders for Horses.
Victor Dryden's Embrocation for Horses and Cattle.
Victor Dryden's Gripe Drench for Horses and Cattle.
Victor Dryden's Liquid Blister for Horses and Cattle.
Victor Dryden's Poultry Specific for Warts.
Victor Dryden's Scour in Calves.
Victor Dryden's Wound Dressing for Horses and Cattle.
Victor Dryden's Worm and Condition Powders.

Goldsborough Mort & Co. Ltd., 63-71 Eagle street, Brisbane.

Harton Arsenical Sheep Drench.
Wurm-Ez-Ol Sheep Drench.
Carbene Sheep Drench.
Cee-Tee-Cee Sheep Drench.
To-Cu-Sul Sheep Drench.
Too-Partz Sheep Drench.
Taipo Sheep Drench.

Gollin & Co. Pty. Ltd., 70-72 Eagle street, Brisbane.

Meggitt's Pure Medicinal Linseed Oil.

Green & Rawkins, Flinders street, Townsville.

Wonderdog Purgative Pills.
Wonderdog Diuretic Pills.
Wonderdog Condition Powders.
Wonderdog Skin Lotion.
Wonderdog Greyhound Tonic.
Wonderdog Vitatone.
Wonderdog Puppy Worm Syrup.
Wonderdog Tonic Tablets.
Wonderdog Ear Canker Powder.
Wonderdog Worm Powders.
Wonderdog Special Formula Powders.
Wonderdog Cough Mixture.

Happidog Store Pty. Ltd., 450 Queen street, Brisbane.

Happidog Canker Lotion.
Happidog Skin Lotion.
Happidog Eczema Lotion.
Happidog Eye Ointment.
Happidog Alterative Powder.
Happidog Worm Capsule.
Happidog Worm Powder.
Happidog Worm Syrup.
Happidog Pad Lotion.
Happidog Condition Powder.
Happidog Antiseptic Lotion.

Harveyson, T. C., Dorrington Drive, Ashgrove, Brisbane.

"Wellcome" Calcium Borogluconate.

Hayes Veterinary Co., 351 Queen street, Brisbane.

Havcol.
Hayes' Barbed Wire Liniment.
Hayes' Cattle Blight Powders.
Hayes' Cleansing Drench.
Hayes' Condition Powders.
Hayes' Mange Ointment.
Hayes' Scour Powders.
Hayes' Udder Ointment.
Hayes' Wart Lotion.
Yohimbin.
Hayes' Veterinary Ointment.

Imperial Chemical Industries of Aust. & N.Z. Ltd., 108 Creek street, Brisbane.

Phenovis Powder.

Maclean Pty. Ltd., D., Charlotte street, Brisbane.

Baxters Alterative Mixture.
Baxters Skin Lotion.
Baxters Husk Mixture.
Baxters Puppy Worm Syrup.
Baxters Red Tonic.
Baxters Worm Powder for Dogs.
Judges Special Tasteless Horse Laxative.
Judges Blight Powder.
Judges Purple Paint.
Judges Vaginitis Powder.
Judges Nasal Ointment.
Judges Foot Rot Powder.
Judges Scarlet Blister.
Judges Cough and Cold Remedy.
Judges Condition Powder.
Judges Dairy Drench.
Judges Dairy Ointment.
Judges Blight Lotion.
Judges Scour Powder.
Judges Vaginal Pessaries.
Judges Vettoll.
Judges Veterinary Embrocation.
"Judsol."
Vitaforce Greyhound Tonic.
Judges Wart Ointment.

Mactaggarts Primary Producers Co-op Assn. Ltd., Eagle street, Brisbane.

Mactaggart's Carbol.
Equinoint.
Mactaggart's Medicated Speying and Dehorning Stockholm Tar.
"Max-Tar" Dehorning Dressing.

McDonald & Co., A. H., 99-103 Mary street, Brisbane.

Vetamac Foot Rot Treatment.
Vetamac Pig Drench.
Vetamac Fluke Drench.
Vetamac Fluke and Worm Specific.
Vetamac Antiseptic Capsules.
Vetamac Vaginitis Remedy.
Vetamac Ointment.
Vetamac Antiseptic.
Vetamac Bluestone Nicotine Drench.
Vetamac Pink Eye Powder.
Vetamac Tapeworm Drench.
Vetamac A.B.C. Sheep Drench.
Vetamac Embrocation.
Vetamac Iodine.
Vetamac Calcium Drench.
Calcium Borogluconate.
Vetamac Phenothiazine Emulsion.
Vetamac Stock Drench.

Mitchell, K., 95-97 Eagle street, Brisbane.

Barko Alterative Mixture.
Barko Ear Powder.
Barko No. 1 Mixture.
Barko Ear Lotion.
Barko Eye Lotion.
Barko Eye Ointment.
Barko Iodine Dog Soap.
Barko Pad Paint.
Barko Skin Lotion.
Barko Tonic Food.
Barko Worm Powders for Dogs.
Barko Condition Powders.

Morden Laboratories, 66 Charlotte street, Brisbane.

Morden Diarrhoea Mixture for Poultry.
Morden Catarrh Mixture for Poultry.
Morden Cough Mixture for Dogs.

New Zealand Loan & Mercantile Agency Co. Ltd., Eagle street, Brisbane.

Coopers Improved Worm Tablets.
Zealone A.H.P. Sheep Drench for Worm and Fluke.
Coopers Antiseptic Powder.
Coopers Liquid Worm Remedy for Puppies and Dogs.
Phenovine.
Coopers Condition Powders.

Noble & Gegg, W. A., Ruthven street, Toowoomba.

Nobles Aperient Pills for Large Dogs.
Nobles Aperient Pills for Small Dogs.
Nobles Blight Lotion for Cattle, Horses and Sheep.
Nobles Cleansing and Tonic Dairy Drench.
Nobles Colic and Gripe Drench.
Nobles Dairy Ointment.
Nobles Dog Alterative.
Nobles Non-Irritant Fluid Blister.
Nobles Physic Balls for Horses and Cattle.
Nobles Scour Remedy for Calves.
Nobles Tonic Alterative and Condition Powders for Horses.
Nobles Vettoll.
Nobles Worm and Condition Pills for Large Breeds.
Nobles Worm and Condition Pills for Small Breeds.
Nobles Worm Specific for Puppies.
Nobles Wart Ointment for Poultry.
Nobles Dog Condition Powder.
Nobles No. 11 Worm Capsules.
Nobles Worm and Physic Balls for Horses.
Nobles Powder for Vaginitis.
Nobles Canker Lotion.
Nobles Lavender Paint.
Nobles Pink Powder for Blight.

Nobles Pty. Ltd., Eagle street, Brisbane.

Contagious Vaginitis Ointment.
Sykes's Abortex.
Sykes's Animal Colic Remedy.
Sykes's Animol.
Sykes's Creatol.
Sykes's Drench.
Sykes's Farm and Home Embrocation.
Sykes's Germ Killer.
Sykes's Bag Balm.

Norris Agencies Ltd., 639 Ann street, Brisbane.

C.N. Coro-Noleum 25%.
Sidolia.

Nyal Co. (A. Light, Rep.), G.P.O., Box 423 F., Brisbane.

Krect Condition Powders.
Krect Condition Tablets.
Krect Laxative and Stomach Tablets.
Krect Mange Lotion.
Krect Puppy Worm Syrup.
Krect Worm Capsules.
Krect Dog Ointment.

O'Reilly, R., Sparkes Avenue, Hamilton.

Nema Worm Capsules.
Equine Cough Syrup (Veterinary)
Kamala.
Arecoline Hydrobromide.

Osmond & Sons Pty. Ltd., Stanley street, South Brisbane.

Bronkos.
Osmond & Sons Lincolnshire Red Draught.
Osmonds Antiseptic Pessaries.
Osmonds Bot Capsules.
Osmonds Brown Draught.
Osmonds Cattle Oils.
Osmonds Cattle Shampoo.
Osmonds Compound Santonin Worm Powders.
Osmonds Worm Drench and Fluke Kill (Single Strength).
Osmonds Worm Drench and Fluke Kill (Double Strength).
Osmonds Foot Rot Paste.
Osmonds Pig Powders.
Osmonds Saltona Condition Salt.
Osmonds Special Scour Cordial.
Osmonds Special Worm Drink for Horses.
Osmonds Vaccadyne.
Osmonds White Oils.
Osmonds Fluid Zenos Disinfectant.
Osmonds Concentrated Ovolis.
Osmonds Vitaline.
Osmonds Aphrodisaic Powder.
Osmonds Chlorosyl.
Osmonds Grease Wash.
Osmonds Restoral.
Osmonds Physic Balls.
Osmonds Nikop.
Osmonds Hooseiline.
Osmonds Ethodyne.

Pennefather, E. K., 39 Tower street, Albion Heights, Brisbane.

Golden Egg Fowl Pox Vaccine (Attentuated).

Poultry Farmers Co-op. Soc. Ltd., Roma street, Brisbane.

Healo.
Red Comb Fowl Pox Vaccine (Attenuated).
Red Comb Scaly Leg Ointment.
Red Comb Vaginitis Powder.
Red Comb Worm Capsules.
Red Comb Nicotine Sulphate "40."
Red Comb Condition Powders.

Queensland Chemical Distributing Co., The, 107 Eagle street, Brisbane,

Vetrolene.

Queensland Pastoral Supplies Ltd., Bowen street, Brisbane.

"Hibiscus" Nicotine Sulphate.

Riddell, R. A., Rome street, Yeronga, Brisbane.

Istin.
Nemural.
Veridan.
Ascaridol.
Carbo-Pulbit.
Pellidol Ointment.
Omnadin.
"Aricyl."

Robinson & Bott Pty. Ltd., 459 Adelaide street, Brisbane.

Rawleigh's Colic and Bloat Ease.
Rawleigh's Veterinary Application.

Roush, E. A., 45 Queen street, Brisbane.

Electron Worm Killer for Poultry.
Chemist Roush Condition Powders for Dogs.
Chemist Roush Mange Lotion.
Chemist Roush Puppy Worm Syrup.
Chemist Roush Worm Capsules for Dogs (A).
Chemist Roush Worm Capsules for Dogs (B).
Chemist Roush Eye Roup Drops for Poultry.
Chemist Roush Scaly Leg Ointment for Poultry.
Chemist Roush Ear Drops for Dogs.
Chemist Roush M.N.B. Tablets for Dogs.
Chemist Roush Dog Tonic.

Salmond & Spraggon (Aust.) Pty. Ltd., 499 Adelaide street, Brisbane.

Bob Martin's 92 Ointment.
Bob Martin's Condition Powders.
Bob Martin's Worm Tablets.
Bob Martin's Worm Powders.
Elliman's Royal Embrocation for Horses and Cattle.
"Tibs" Cat Powders.

Sharkey, S. B. V, 163 Shakespeare street, Mackay.

Sharkey's Hobble Chafe Lotion.

Shaw, H. G., King House, Queen street, Brisbane.

Tilley's Timid Joe Dog Soap.

Spedosol Supply Co., Box 1483V., G.P.O., Brisbane.

Spedosol Powder.

Stephan, C. A., 201 Sandgate road, Albion, Brisbane.

Eurythmic Healing Lotion.

Surgical Supplies Ltd., Queen street, Brisbane.

Bio Blackleg Aggressin.
Bio Blackleg Toxiculture.
Bio Pleuro Virus.
Bio Strangles Toxiculture.
Bio Blackleg Solid Aggressin.
Dr. Metcalfe Sharpe's Application.
Sapocarb.
Sexine.
Surgical Supplies Blister.
S.S. Blight Powder.
S.S. Lung Worm Specific.
S.S. Scour Cure.
Wart and Horn Solvent.
Bio Flatulent Colic Drench.
Bio Special Colic Drench.
Bio Absorbine (Liquid).
Bio Fowl Pox Vaccine.
Bio Soothing Liniment.
Stewart's Bio Royal Embrocation.

Taylors Elliotts Pty., Ltd., 150 Charlotte street, Brisbane.

Austral Aloetic Physic Ball.
Austral Diuretic Drench.
Austral Cooling Lotion.
Austral Dairy Ointment.
Austral Dusting Powder.
Austral Gripe Drench.
Austral Horse Blister.
Austral Iodine Capsules.
Austral Lung Worm Drench.
Austral Pig Cough Powder.
Austral Pig Purgative Powder.
Austral Scour Drench.
Austral Trypan Blue.
Austral Vaginal Pessaries.
Doyle's Laryngine.
Reducine.
Skinner's Drench.
Weaver's Sheep Drench.
Austral Canker Ointment for Dogs.
Austral Cold and Fever Mixture for Dogs.
Austral Green Liniment for Dogs.
Austral Mange Lotion for Dogs.
Austral Puppy Worm Syrup.
Austral Tonic Powders for Dogs.
Austral Worm Capsules for Dogs.
Austral Barb Wire Embrocation.
Austral Caustic Stick.
Austral Purgative Drench.
Austral Gall Ointment.
Austral Liquid Blister.
Austral Pig Worm Powders.
Austral Regulating Drench.
Austral Ringworm Ointment.
Austral Vaginal Douche Powders.
Austral Veterinary Embrocation.
Austral Wart Paint.
Austral Condition Powders.
Cupiss Tonic Powders.
Cupiss Aromatic Physic Balls.
Cupiss Constitution Balls.
Dog Constitution Capsules.
Evans Pirevan.
Elliotts Mulgar.
Elliotts Worego.
Elliotts Coolabar.
Elliotts Brolgar.
Elliotts Galar.
Elliotts Backus.
Elliotts Prenzeen.
Skinner's Ointment.
"Cylol."

Tudor & Petty, H. G., Russell street, Toowoomba.

Vaginitis Powder.

United Chemicals Pty. Ltd., Montague road, South Brisbane.

Germacol.
United Fluke and Worm Drench.
United Medicated Stockholm Tar.
United Nicotine Sulphate—Bluestone Worm Drench.

Wilcox Mofflin Ltd., Barry Parade, Brisbane.

Cesto Tape Worm Drench.
Wilmo Enema Solution.
Red Spot Double Strength Carbon Tetrachloride Drench.
Tetralene.
Tri Kos Concentrated Sheep Drench.
Wilmolene.
Nikosul.
Tri Kos (Nicotine Sulphate and Copper Sulphate—Separate Ingredients).
B.A.H. Sheep Drench.

Wilkinson (Nth.) Pty. Ltd., L. A., Lower Ann street, Valley, Brisbane.

Wilkinson's Worm Capsules for Dogs and Puppies.
The L.P. Barb Wire Embrocation.
Wilkinson's Canker Lotion for Dogs.
Wilkinson's Dog Tonic.
Wilkinson's Laxative Dog Syrup.
Wilkinson's Mange Lotion for Dogs.
Wilkinson's Worm Syrup for Dogs.

Williams, F. 25 Cordelia street, South Brisbane.

Non-pareil Powerful Germicidal Fluid Cleanser.

INDEX OF BRANDS OR TRADE NAMES.

Brand or Trade Name.	Primary Dealer.
Acco	Australian Chemical Co. Ltd.
Andrew Dryden's	A.C.F. & Shirleys Fertilizers Ltd.
Austral	Taylors Elliotts Pty. Ltd.
Barko	Mitchell, Kenneth.
Baxter's	Maclean Pty. Ltd., D.
Bayer	Riddell, R. A.
Bio	Surgical Supplies Ltd.
Bob Martin's	Salmond & Spraggon (Aust.) Pty. Ltd.
Chemco	Carvosso, P. H.
Chemist Roush	Roush, E. A.
Cooper's	New Zealand Loan & Mercantile Agency Co. Ltd.
Cupiss	Taylors Elliotts Pty. Ltd.
David's	David, F. D.
Doyle's	Taylors Elliotts Pty. Ltd.
Dryden's	A.C.F. & Shirleys Fertilizers Ltd.
Dryden's	Victor Dryden.
Electron	Roush, E. A.
Elliman's	Salmond & Spraggon (Aust.) Pty. Ltd.
Elliotts	Taylors Elliotts Pty. Ltd.
Eurythmic	Stephan, C. A.
Evans	Taylors Elliotts Pty. Ltd.
Fleego	David, F. D.
Golden Egg	Pennefather, E. K.
Hagley's	Butler & Co. Pty. Ltd., Ed.
Hamilton	Baynes, J. H.
Happidog	Happidog Store Pty. Ltd.
Harton	Goldsbrough Mort & Co. Ltd.
Hayes'	Hayes Veterinary Co.
Hibiscus	Queensland Pastoral Supplies Pty. Ltd.
Judges	Maclean Pty. Ltd., D.
K-Nine	David, F. D.
Krect	Nyal Co., Representative, Light, A.
Mactaggart's	Mactaggarts P.P. Co-op. Assn. Ltd.
Mawson's	Armitstead, J.
"Max-Tar"	Mactaggarts P.P. Co-op. Assn. Ltd.
Meggitt's	Gollin & Co. Pty. Ltd.
Moase's	Davey, Mrs. M. E.
Morden	Morden Laboratories.
Nema	Parke Davis & Co., Representative, O'Reilly, R. deV.
Nobles	Noble & Gegg, W. A.
Non-Pareil	Williams, F
Osmonds	Osmond & Sons Pty. Ltd.
Pegasus	Bryce Ltd.
Pro-Vet	Baynes, J. H.
Radiol	Bickford & Sons Ltd., A. M.
Rawleighs	Robinson & Bott Pty. Ltd.

INDEX OF BRANDS OR TRADE NAMES—continued.

Brand or Trade Name.	Primary Dealer.
Red Comb	Poultry Farmers Co-op. Soc. Ltd.
Sayers	Dalgety & Co. Ltd.
Sharkey's	Sharkey, S. B. V.
Sidolia	Norris Agencies Ltd.
Skinner's	Taylors Elliotts Pty. Ltd.
Spedosol	Spedosol Supply Co.
S.S.	Surgical Supplies Ltd.
Stewart's	Surgical Supplies Ltd.
Stockaid	Queensland Pastoral Supplies Pty. Ltd.
Sykes's	Nobles Pty. Ltd.
"Tibs"	Salmond & Spraggon (Aust.) Pty. Ltd.
Tilley's	Shaw, H. G.
United	United Chemicals Pty. Ltd.
Vermort	Baynes, J. H.
Vetamac	McDonald & Co., A. H.
Victor Dryden's	Dryden, Victor.
Vitaforce	Maclean Pty. Ltd., D.
Vita-Lick	Goldsbrough Mort & Co. Ltd.
Wagstaff's	Australian Disinfectant Co.
'Wellcome"	Harveyson, T. C., Representative, Burroughs Wellcome.
Weaver's	Taylors Elliotts Pty. Ltd.
Wilkinson's	Wilkinson (Nthn.) Pty. Ltd., L. A.
Wonderdog	Green & Rawkins.
Zealone A.H.P.	New Zealand Loan and Mercantile Agency Co. Ltd.

Plate 140.

A PALM GROVE AT GRANADILLA, NORTH QUEENSLAND.

MARKETING

The Dairymen's State Council.

H. S. HUNTER, Director of Marketing.

THE Queensland Dairymen's State Council is the first primary producers' statutory organization, as distinct from a marketing board, to be set up in this State since the reconstruction of the Queensland Primary Producers' Organization brought about by the 1926 and 1938 Amendments of *The Primary Producers' Organization and Marketing Acts.* The original statutory organization, which was set up under *The Primary Producers' Organization Act of* 1923, embraced, on a geographical basis, all primary producers irrespective of the commodity with which they were associated. The objects of this measure were, however, not fully achieved. The organization degenerated into a series of pressure groups and consequently it ceased to be effective.

One of the principal reasons for the ineffectiveness of the old statutory organization was that producers having interests in common were not grouped, as has always been the case with the Queensland Cane Growers' Council, a statutory body which, by contrast, has been quite successful.

This weakness was early recognized and was partly corrected by the 1926 amendment of the *Primary Producers' Organization and Marketing Acts,* which modified the set-up of the old Council of Agriculture, constituted entirely on a geographical basis, and gave it a new constitution whereby all commodity boards were represented. However, it was only a partial or compromise re-organization, since the nine districts of the State proclaimed under the original legislation retained representation on the Council, notwithstanding that the old district councils had been abolished by the amendment.

In due course, the organization was completely reconstructed on a commodity basis by the 1938 amendment to the Acts. By this amendment, the old conception of a purely geographical primary producers' organization was abandoned and the Council of Agriculture was reconstituted on a 100 per cent. commodity basis in addition to Government representation.

Coincident with this re-organization, the amending Act conferred additional powers on the commodity marketing boards. The amendment provided that, in addition to its marketing powers, a board should be concerned with the preservation, expansion, and economic well-being of the industry which it represents and should be a medium of communication between the Government or, as the case may be, the Council of Agriculture, and all engaged in or associated with such industry. Each board was also charged with the duty of taking cognizance of agricultural as well as marketing problems arising out of or associated with its particular industry.

Powers of Commodity Boards.

Specific powers given to commodity boards under the 1938 Amendment included the following:—"Generally doing all such things and taking all such steps as may from time to time be approved for the protection, advancement, or furtherance of the industry in respect of which it was constituted and or of the producers engaged in that industry." It is therefore within the province of a marketing board to set up a field organization or to take such other measures as it considers necessary to give individuals engaged in the industry a means of expressing themselves through a mouthpiece for the industry.

That type of rank-and-file organization under the auspices of a marketing board is, however, not applicable to the dairy industry for the reason that marketing boards set up for butter and cheese are representative of the producers of butter and cheese, i.e., the butter and cheese factories, and not of the rank and file of dairymen. Furthermore, the dairy industry covers a fairly wide field of activity in which more than one marketing board is concerned, e.g., Butter, Cheese, and Milk Boards. Because of these peculiarities of the dairy industry, the organization of the rank and file has been given effect through another provision of the Acts (Section 30) which applies to the sugar industry, and, for the reasons mentioned, this method of organization for the dairy industry is not to be regarded as a precedent for adoption by other primary industries which have commodity boards set up for the marketing of their products and which are directly representative of the famers themselves.

The Constitution of the Queensland Dairymen's Organization.

The constitution of the new Queensland Dairymen's Organization under Section 30 is a departure to some extent from the Queensland Cane Growers' Council, on which it has been modelled, in that there is no parallel association of its functions with the operation of a factory as is the case with the mill suppliers' committees which are the Queensland Cane Growers' Council's counterparts of the local dairymen's committees.

The various organizations within the dairy industry will note that this situation is not without its risks, as it would be possible for the various bodies representing dairying to become divided on points of view and consequently the industry would not be able to speak with one voice on vital matters.

The constitution of the Dairymen's State Council was the second step towards the setting up of a statutory dairymen's organization. A commencement was made by electing representatives of the dairymen to serve on district dairymen's councils, and these councils have now in turn elected representatives to a central organization.

It should not be overlooked, however, that the whole organization rests on the foundation of local dairymen's committees. Because of practical and legal difficulties, a commencement in setting up the organization was made by electing the district dairymen's councils.

The constitution of the organization provides that—

> "The Queensland Dairymen's State Council may from time to time declare any part of Queensland to be an area for the purpose of establishing therefor a Local Dairymen's Committee and may from time to time abolish, subdivide, or alter the boundaries of any such area or amalgamate two or more of such areas."

The activities of the whole organization as a statutory body will have to conform to conditions prescribed by regulation.

This recently-established Queensland Dairymen's Organization now takes its place within the statutory agricultural organization of the State. Consequently, it will have duties and functions to perform in its own right within the general framework of that organization.

The main function confronting the new dairymen's statutory body is associated with the welfare of the industry generally and, in particular, the welfare and efficiency of the industry in its local areas. It is important, therefore, that the organization should build upon a solid foundation of efficient and virile-functioning local dairymen's committees.

It will be the first function of the Dairymen's State Council to define local areas and set up therein the prescribed local committees. Future elections in the organization will proceed from the Local Committee level through the District Council to the State Council.

MORE MILK MEANS HEALTHIER PEOPLE.

A well-known medical man told a team of butter factory workers, and others interested in the dairy industry, recently that Australia produces the best milk and butter in the world. He was talking on the importance of milk in the national diet. Our cattle are grass fed in the paddock, and that is better, he said, than stall feeding for quality production. Unfortunately, however, even though we do produce the best milk under the freest fresh air and sunshine conditions, we do not drink enough of it. In fact, Australians drink less milk than the people of most other countries which are said to possess an advanced civilisation. As a matter of fact Australians drink less than half a pint of milk per person per day, as compared with three-quarters of a pint per person per day swallowed by Canadians and their neighbours in the United States. Even the people of Britain drink more milk than we do, in spite of the serious shortage of dairy products they have had to put up with during the past seven years. The people of the Old Country, apparently, are still "on the bucket" while we seem to have weaned ourselves off it.

Milk to-day is of much higher quality than it used to be, thanks to the efforts of many dairy farmers who know the value of sound dairy practice in all its aspects (especially in the milking shed), in association with dairy advisers and veterinary officers, and of course, the Department of Health. Australia leads the world in regard to pure food regulations, the doctor told his audience, adding that there is no finer investment than putting clean milk into babies. Then he went on to say that "there is something wrong with our intelligence when we spend millions and millions a year on beer and only a modicum of that amount on milk. Milk is more important than meat or bread or beer and the sooner Australians wake up to that fact the better it'll be for our children."

Probably no one will dispute the wisdom of the doctor's contention that healthy citizens are the best asset a nation can have—and that more milk means a healthier people.

GENERAL NOTES

Milk and Cream Pasteurization Plants at Warwick and Innisfail.

Orders in Council have been issued under *The Milk Supply Act of* 1938 authorizing the Warwick Co-operative Dairy Association, Limited, of Warwick, and the Millaa Millaa Central Tableland Co-operative Butter Association, Limited, of Millaa Millaa, to establish and carry on pasteurization plants at Warwick and Innisfail, respectively, and to supply pasteurized milk and cream within the areas of the city of Warwick and the Innisfail district.

The Poultry Advisory Board.

In pursuance of the provisions of *The Poultry Industry Act of* 1946, the Governor in Council has approved of the constitution of the Poultry Advisory Board for the period from 14th November, 1946, to 31st December, 1947.

The members of the Board are: Hon. H. H. Collins, M.L.A., Minister for Agriculture and Stock (Chairman); Mr. P. Rumball, Officer in Charge, Poultry Branch, Department of Agriculture and Stock; Dr. M. White, Agricultural Chemist, Department of Agriculture and Stock; Mr. E. C. Knoblauch, representing growers supplying eggs to the Queensland Egg Board; Mr. C. Kidd, representative of the Poultry Farmers' Co-operative Society; Mr. D. Anderson, President of the N.U.P.B.A.; Mr. J. W. Bailes, President of the Poultry Farmers' Union.

The Navy Bean Board.

An Order in Council has been issued under *The Primary Producers' Organization and Marketing Acts* declaring that all navy beans the produce of the soil within any part of the State of Queensland and produced or to be produced for sale from 7th November, 1946, up to and including 6th November, 1949, are and shall be a commodity under and for the purposes of such Acts, and constituting the Navy Bean Marketing Board in relation to such commodity.

The growers' representatives on the Navy Bean Board are Messrs. H. Bird (Tingoora), A. Francis (Kumbia), T. Brewer (Mount Sturt), and M. P. Roche (Danderoo). These representatives, together with the Director of Marketing, Mr. H. S. Hunter, will hold office until 6th November, 1949.

Brisbane Milk Board.

The term of office of the present Brisbane Milk Board will expire on 31st January, 1947, and an election of members of the fourth board will be held at an early date. An Order in Council under *The Milk Supply Act of* 1938 provides that the number of representatives of producers on such Board shall be three, and the number of representatives of wholesale vendors, three also. Producers and wholesale vendors have been similarly represented on previous boards.

Sugar Levies.

Regulations under *The Primary Producers' Organization and Marketing Acts* have been approved empowering the Mourilyan Mill Suppliers' Committee to make a general levy for administrative purposes on suppliers to the Mourilyan Mill at the rate of 1½d. per ton of sugar-cane.

The Goondi Mill Suppliers' Committee is empowered to make a further general levy for administrative purposes on suppliers of sugar-cane to the Goondi Mill at the rate of ¼d. per ton, and the Innisfail District Executive may also make a further general levy on suppliers of sugar-cane to the Goondi, Mourilyan, and South Johnstone mills at the rate of ½d. per ton for administrative purposes.

Rural Topics

Market for Dairy Products Assured.

At a welcome home function accorded him by the Queensland Co-operative Dairy Companies' Association, Mr. Chris. Sheehy (Commonwealth Dairy Produce Controller), who with Mr. G. C. Howey represented Australia in recent negotiations between the United Kingdom Ministry of Food and the Commonwealth Government on prices and conditions to apply under the long-term contract for the sale of Australia's surplus dairy products, gave an absorbingly interesting account of his experiences abroad.

Australian dairy farmers, he said, could produce profitably for a few years because of the certain shortage of butterfat in world markets.

"Dairy farmers can go ahead with confidence and produce abundantly, knowing that they will be able to market their product," said Mr. Sheehy. "In 1948, 1949, and possibly 1950, there will be a good world market for the whole of Australia's output of butter and cheese at reasonably satisfactory prices."

Mr. Sheehy added that great advances had been made overseas in the improvement of breeds of dairy cattle, and in increasing the output of the dairy cow. In America it was expected that 600,000 cows would be bred by artificial insemination before long. Possibilities were limited only by the number of proven bulls available.

"In America also great strides have been made in the elimination of disease," Mr. Sheehy continued. "Tuberculosis has been almost eliminated. The danger now is not so much the transmission from the cow to the human being, as from the human being to the cow."

With the Australian Dairy Farmers' Federation president (Mr. Howey), Mr. Sheehy went through many American universities, saw most departmental Ministers, and was given full information.

"What struck us most was the tremendous size of the cows in many magnificent American herds," he said "We were told these weighed between 1,500 lb. and 2,000 lb.

"At Madison University we saw a bull which turned the scales at 2,600 lb. The professor told us that Americans treated their herds as they would treat machines. Their policy seemed to be—the bigger the machine the bigger the output."

Mr. Sheehy said that any sacrifice made in Australia to send food to Britain would be worth while. The Danish Agriculture Minister had emphasised the need for countries supplying Britain to get together now to stabilise the dairy produce market.

The association's president (Mr. T. F. Plunkett, M.L.A.), Hon. H. H. Collins (Minister for Agriculture and Stock), Mr. A. G. Muller, M.L.A., and representatives of many dairy producers' organisations and co-operative associations joined in the welcome to Mr. Sheehy.

A Farrer Memorial.

Near the civic centre of Queanbeyan (New South Wales) there is a bronze bust upon a pedestal backed by a pleasant bank of greenery. The inscription on the memorial dedicates it to "William James Farrer, Australian World-Famed Wheat Breeder." Underneath is the quotation of his own remark: "I want to think when the end comes that my life has not been wasted."

At the base of the column there are bronze reliefs depicting farming scenes inset in the stone of the monument. Near Queanbeyan, in the Tharwa district of what is now Federal Capital Territory, William Farrer lived on a farm, "Lambrigg," where he worked and died.

In his book, "Canberra, Its History and Legends," the late John Gale, veteran Press chronicler of the Queanbeyan district, says that Farrer assisted him materially in his advocacy of Canberra as the Commonwealth Capital site. So appropriately, and almost prophetically, Farrer evolved his famous Federation wheat in what was to be Federal Capital Territory and so laid the foundation of Australia's great grain growing industry.

Care of Mother and Child.

Under this heading an article supplied by the Maternal and Child Welfare Service of the Department of Health and Home Affairs, dealing with the welfare and care of mother and child, is published each month.

HOW MUCH DOES YOUR CHILD WEIGH?

The majority of mothers nowadays have their babies weighed regularly in the first few months, but seem to think that the continuance of this practice is unnecessary once the child's first year has passed. This is a very wrong idea. The progress of a child's health is shown in his growth and weight, and a steadily increasing weight is one index of healthy growth. The human body may be likened to a bank where children can be taught to store up health instead of money. The gain in weight shows the child the amount on deposit in his "health bank." If the child is weighed regularly every month he becomes interested and thinks it fun to find out just how much he has put into his health savings account.

Mothers are used to following baby's weight chart, and it is just as easy to do the same for their toddlers—they should know that underweight in the older child may be a sign of over fatigue, loss of sleep, indigestion, or perhaps some emotional problem in his daily life.

Weight-for-height tables are procurable, and an average is given in the booklet, "Care of Mother and Child." The rule which requires a child's weight to be within 10 per cent. of the average is based on careful study. It is the safest standard yet found, and is reasonably correct. If the child remains 10 per cent. or more *below* average weight for height, the cause should be investigated.

The same scales should be used for each weighing to avoid making a false record, as scales may vary. The child should also be weighed in the same clothing and at the same hour of the day each time, as there may be a difference of 1 or 2 lb. as a result of meals, sleep, or exercise.

The sister at your Welfare Centre will weight and measure your toddler regularly until he goes to school, but if you are too far away from a Centre, one of your local storekeepers may be able to help you with the weight, or you may, as supplies improve, be able to purchase a simple type of platform scale yourself—then mother and father can keep an eye on their weight also.

How to take the Height.—

(*a*) Nail two yard-sticks or tape measures end to end on the wall, extending from the floor upward, and leave them there.

(*b*) Stand the child in his stocking feet flat against the wall with the head, shoulders, buttocks, and heels touching the wall.

(*c*) Place a cigar box or similar small box over the head and hold it firmly against the measuring scale.

(*d*) Read the height in inches as shown where the bottom of the box meets the measuring scale.

A child's health cannot be measured by weight or height alone, but these must be taken into consideration with colour, firmness of muscles, posture, &c. Your family doctor or the doctor at your Toddlers' Health Centre will advise you whether your child has a big enough balance in his health bank. Next month we will talk a litle more about the child who is underweight.

Any further advice on this or any other matter can be obtained by communicating personally with the Maternal and Child Welfare Information Bureau, 184 St. Paul's Terrace, Brisbane, or by addressing letters. "Baby Clinic, Brisbane." These letters need not be stamped.

IN THE FARM KITCHEN.

Rolled Oats Bread.

Two cups boiling water, ½ cup molasses (brown or white sugar), 2 teaspoons salt, 1 tablespoon butter, 1 yeast cake dissolved in ½ cup lukewarm water, 1 cup rolled oats, 5 cups enriched flour. Add boiling water to oats and let stand one hour; add molasses, salt, butter, dissolved yeast cake, and flour. Beat thoroughly, let rise, and beat again. Turn into buttered bread pans, let rise again and bake 50 to 60 minutes in a hot oven (375 to 425 deg. F.). If desired after the first rising, add 1 cup chopped nuts or prunes, cut in pieces, or use ½ cup chopped nuts and 1 cup prunes.

Moonshine Pudding.

Boil 1 cup water with ½ cup sugar. When boiling, stir in 1 tablespoon arrowroot, mixed to a cream with the strained juice of a large lemon. As soon as the mixture thickens take off fire, cool slightly, and blend well with stiffly-beaten whites of 2 eggs. Ready for use as soon as cool. Serve with custard sauce made with the 2 eggs yolks, 2 cups milk and 1 tablespoon cornflour. Stir together in a double boiler until mixture coats the spoon, cool, and add a dash of essence of lemon.

Wholemeal Sultana Loaf.

Four oz. plain flour, 6 oz. sultanas, ¼ teaspoon salt, 3 tablespoons brown sugar, 1 tablespoon butter, 4 oz. bran, 2 teaspoons baking powder, 1 egg, 1 small cup milk. Rub butter and sugar together. Add sifted dry ingredients, and rub butter and sugar mixture well into these. Add fruit and lastly egg beaten in the milk. Bake for one hour in round nut loaf tins (without lids) in a moderate oven.

Family Loaf.

When making bread, after the first rising, take some dough and into it work a handful of stoned raisins, a little candied peel, the juice of two oranges, a little sugar, two egg yolks, some butter (about a tablespoon) and some fresh dates. Work all this well in, grease a loaf tin, put the dough in, and set it to rise again. When risen bake, and when baked rub a little melted butter over the crust. This is a great favourite with children.

Dumplings with Boiled Meat.

Four oz. flour, ¼ teaspoon baking powder, 1½ oz. suet or cooking fat, a piece of chopped onion, 1 teaspoon chopped parsley, salt and pepper. Mix the fat with the flour and baking powder, rubbing it in if necessary. Add onion, parsley and seasoning, then sufficient water to form a light dough. Divide into 12 balls, flour each ball and add to the boiling liquid in which the meat is cooking. Simmer for 30 minutes.

Yorkshire Pudding.

Four oz. flour, 2 oz. mashed potato, 1 teaspoon baking powder, ¼ teaspoon salt, ½ pint milk or milk and water, 1 egg, 2 tablespoons dripping from the meat.

Mix the flour, mashed potato and salt together in a basin. Make a hollow in the centre of the flour and gradually mix in the egg and milk, keeping the batter free from lumps and beating until smooth. Stir in the remaining milk and add the baking powder last of all. Choose a rather shallow tin (a sandwich tin is excellent) in which to bake the pudding. Place 2 tablespoons of dripping from the joint in the tin and put in a hot oven for several minutes until the fat is smoking hot. Pour in the batter on top of the fat immediately and bake in the top of a hot oven (about 420 deg. F.) for 30-40 minutes, until well risen and golden brown. Cut in sections and serve. Remember, a hot oven, hot fat and a hot tin make a success when baking Yorkshire pudding.

QUEENSLAND WEATHER IN NOVEMBER.

Some local thunderstorms were reported in the Eastern Divisions of the State, 10th/11th, but the main unsettled period was between the 14th and 21st when late seasonal afternoon and evening thunderstorms benefited parts of the dry Central Highlands from Aramac north to Balfes Creek, and from Pine Hills east to the Central Coast between Byfield and Gladstone. The better served areas reported from 2 to 5 inches. Over average storms were registered in the Camooweal, Kamilaroi, Duchess triangle and along the Southern Border from Thallon to Stanthorpe. The only districts showing over average aggregate rains were Peninsula North (the results of a heavy rain at Thursday Island from a small cyclonic disturbance), the Central Coast West 204 points (average 161), and the South Coast Port Curtis 351 points (average 272). About normal rainfall figures were reported in the Central Highlands and Darling Downs East and West. Practically all inland areas west of the Downs continued under drought conditions, and the North Coast tropical areas showed deficiencies of 73 to 80 per cent. Cumulative storm benefits in the south-east between the Eastern Downs and the Coast should be consolidating the improved prospects in agricultural and pastoral industries. North from the Downs and through the Port Curtis and Central Coast areas storm distribution has been patchier and follow-up rains are still necessary in many areas, especially the Central Coast and North Coast Divisions (unusually dry since March). Apart from the scattered and temporary storm benefit during November in parts of the North-West and South Carpentaria, the months of October and November showed an almost complete failure of the usual patchy and variable seasonal distribution of local inland thunderstorms necessary to relieve the dry to drought conditions prevailing in so many districts west from the Maranoa to the Border and north to the Peninsula.

Pressure.—During the month there was an absence of any favourable inflow of warm tropical air to inland districts, and indefinite shallow gradient inland "lows" of the heat pool type commenced operations in the first week. Contraction to trough formation in Western Queensland on the 6th and 7th, and eastward movement with the associated cooler southerly front of the following "high" only brought local thunderstorms in the south-east of the State. Inland trough and southern low control became more in evidence on the 12th producing local thunder, and by the 17th the inland isobaric dip and an East Coast high pressure ridge were accompanied by a northerly wind circulation along the Central and South Coast of Queensland. This persistent formation, assisted by a moderate cold front from the inland "high," brought a series of afternoon and evening variable thunderstorms mainly in the South-Eastern Divisions till the 20th and 21st. The next two series of trough and high pressure movements produced no rain. A few showers on the far North Coast, 26th to 28th, accompanied moderate south-easterlies from the eastern "high." Between the 26th and 28th Thursday Island reported approximately 10 inches of rain (652 points on the 28th). This was the result of a small but apparently active cyclonic centre operating to the northward which ultimately filled in around its active area.

Local hail damage accompanied the thunderstorms and very extensive damage and losses (16th/17th) were reported in the Cleveland and adjacent farming districts. Quite a number of these local damage reports were received from many districts in the State. Heavy local blows in the dry and hot inland areas showed the usual tornadic characteristics.

Temperatures.—Maximum temperatures were mostly above normal, especially inland, ranging from 1.9 deg. at Longreach to 7.1 deg. at Mitchell. Greatest minimum departures also ranged from 2.4 deg. above at Thargomindah to 3.5 deg. at Longreach. The highest daily maximum reading of 109 deg. was reported at Cloncurry (30th), Camooweal (15th), Urandangie (12th/13th), Winton (12th), Longreach (12th), and Thargomindah (29th). Temperatures of over 100 deg. were reported on 21 days at Boulia and Windorah (9 consecutive), also Winton. Urandangie reported a minimum reading of 84 deg. (30th) and Windorah 80 deg. (30th).

Brisbane.—Mean Pressure $\frac{9+3}{2}$ 29.915 inches (normal 29.958). Temperatures.—Mean maximum 84.0 deg. (normal 82.3 deg.), warmest since 84.1 deg. in 1939. Mean minimum 66.5 deg. (normal 64.3 deg.), warmest since record 67.2 deg. in 1914 and second highest record. Mean temperature, 75.3 deg. (normal 73.3 deg.), warmest since 76.8 deg. in 1915. Highest daily temperature 94.4 deg. on 14th, lowest daily temperature 62.0 deg. on 1st. Rainfall.—84 points on 5 days (average 378 on 10 days). Sunshine.—Mean daily hourly 9.0 hours, highest since 1936, except 1945 (10 hours).

Division.	Normal Mean.	Mean Nov. 1946.	Departure from Normal.	Progressive Totals, May to end of November.	
				Normal.	1946.
	Points.	Points.	Per cent.	Points.	Points.
Peninsula North	199	276	39 above	514	478
Peninsula South	220	14	94 below	440	26
Lower Carpentaria	148	71	52 ,,	336	76
Upper Carpentaria	153	119	22 ,,	473	138
North Coast Barron	298	59	80 ,,	1256	497
North Coast Herbert	353	95	73 ,,	1751	442
Central Coast East	206	162	21 ,,	993	290
Central Coast West	161	204	27 above	684	222
Central Highlands	220	215	2 below	954	328
Central Lowlands	148	121	18 ,,	645	146
Upper Western	105	84	20 ,,	369	88
Lower Western	89	32	64 ,,	429	35
South Coast Port Curtis ..	272	351	29 above	1371	721
South Coast Moreton	357	141	61 below	1879	809
Darling Downs East	277	223	19 ,,	1318	827
Darling Downs West	232	205	12 ,,	1032	519
Maranoa	211	92	56 ,,	1023	265
Warrego	147	31	79 ,,	773	157
Far South-west	109	2	98 ,,	567	40

Commonwealth of Australia Meteorological Bureau, Brisbane.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

NOVEMBER RAINFALL.

(Compiled from Telegraphic Reports.)

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Nov.	No. of years' records.	Nov., 1945.	Nov., 1946.		Nov.	No. of years' records.	Nov., 1945.	Nov., 1946.
North Coast.	In.		In.	In.	*South Coast—cont'd.*	In.		In.	In.
Atherton	2·60	42	1·74	0·65	Gatton College.	2·87	44	3·59	1·27
Cairns	3·81	61	3·38	1·18	Gayndah	2·97	72	1·70	2·93
Cardwell	4·14	71	3·07	1·93	Gympie	3·33	73	1·20	1·33
Cooktown	2·45	67	0·15	Nil	Kilkivan	2·66	62	0·85	0·99
Herberton	2·68	57	2·02	0·65	Maryborough	3·20	72	1·05	0·71
Ingham	3·75	51	1·69	0·44	Nambour	4·21	47	4·16	1·50
Innisfail	6·25	62	2·72	2·21	Nanango	2·86	61	2·98	2·55
Mossman	5·75	19	2·09	1·78	Rockhampton	2·48	72	2·28	2·89
Townsville	1·87	72	0·95	0·16	Woodford	3·29	55	4·00	1·75
Central Coast.					*Darling Downs.*				
Ayr	1·67	56	0·32	0·28	Dalby	2·80	73	3·93	1·48
Bowen	1·24	72	0 09	0·22	Emu Vale	2·81	47	1·68	1·60
Charters Towers	1·43	61	1·54	1·17	Jimbour	2·50	64	4·55	1·57
Mackay	3·05	72	1·63	0·53	Miles	2·58	58	3·91	2·45
Proserpine	2·82	40	1·14	0·76	Stanthorpe	2·76	70	1·37	3·24
St. Lawrence	2·40	72	1·67	1·40	Toowoomba	3·33	71	4·19	2 34
South Coast.					Warwick	2·66	78	1·78	1·91
Biggenden	2·90	44	1·86	2·08	*Maranoa.*				
Bundaberg	2·79	60	0·70	3·45	Roma	2·17	69	1·91	0·69
Brisbane Bureau	3·78	94	4·64	0·84	St. George	1·75	62	0·74	0·46
Caboolture	3·51	67	4·23	2·13					
Childers	2 81	48	0·94	3·19	*Central Highlands.*				
Crohamhurst	4·55	50	2·86		Clermont	2·15	72	0·61	1·93
Esk	3·25	56	4·19	0·93	Springsure	2·39	74	2·09	1·25

CLIMATOLOGICAL TABLE FOR NOVEMBER.

(Compiled from Telegraphic Reports.)

Divisions and Stations.	Atmospheric pressure Mean at 9 a.m.	Shade Temperature.		Extremes of Shade Temperature.				Rainfall.	
		Mean Max.	Mean Min.	Max.	Date.	Min.	Date.	Total.	Wet Days.
Coastal.	In.	Deg.	Deg.	Deg.		Deg.		Pts.	
Cairns	..	86	70	89	30	66	1	118	5
Herberton	..	85	61	96	14	54	4	65	2
Townsville	..	88	73	92	20, 21	66	2	16	4
Rockhampton	29·95	94	66	101	16	61	1, 2, 21	289	6
Brisbane	29·96	84	67	94	14	62	1	84	5
Darling Downs.									
Dalby	..	93	62	99	28	52	6	148	2
Stanthorpe	..	83	53	96	26	43	6	324	6
Toowoomba	..	84	57	95	28	48	11	234	4
Mid-Interior.									
Georgetown	29·89	95	71	110	28	62	3	76	3
Longreach	29·90	99	71	109	12	61	21	56	4
Mitchell	29·88	96	55	104	29	48	1	77	4
Western.									
Burketown	..	95	74	104	15	66	20	Nil	..
Boulia	29·82	101	70	111	12	59	22	10	1
Thargomindah	29·83	98	69	109	29	54	1	4	1

A. S. RICHARDS, Divisional Meteorologist.

Commonwealth of Australia,
Meteorological Bureau, Brisbane.

ASTRONOMICAL DATA FOR QUEENSLAND.

JANUARY.

Supplied by the Astronomical Society of Queensland.

TIMES OF SUNRISE AND SUNSET.

At Brisbane.			MINUTES LATER THAN BRISBANE AT OTHER PLACES.					
Date.	Rise.	Set.	Place.	Rise.	Set.	Place.	Rise.	Set.
	a.m.	p.m.						
1	4.56	6.46	Cairns	49	8	Longreach	43	27
6	5.00	6.47	Charleville	29	25	Quilpie	33	37
11	5.04	6.47	Cloncurry	63	36	Rockhampton ..	18	2
16	5.08	6.47	Cunnamulla ..	28	31	Roma	19	15
21	5.12	6.46	Dirranbandi ..	16	22	Townsville	40	9
26	5.16	6.45	Emerald	27	12	Winton	51	30
31	5.20	6.43	Hughenden ..	48	22	Warwick	3	5

TIMES OF MOONRISE AND MOONSET.

At Brisbane.		
Date.	Rise.	Set.
	p.m.	a.m.
1	12.24	..
2	1.26	12.28
3	2.30	1.04
4	3.38	1.45
5	4.48	2.32
6	5.58	3.27
7	7.04	4.30
8	8.03	5.38
9	8.53	6.48
10	9.37	7.57
11	10.14	9.02
12	10.48	10.03
13	11.20	11.01
14	11.51	11.57
		p.m.
15	..	12.52
	a.m.	
16	12.23	1.46
17	12.57	2.40
18	1.33	3.34
19	2.14	4.29
20	2.58	5.21
21	3.47	6.10
22	4.40	6.56
23	5.35	7.38
24	6.32	8.16
25	7.28	8.51
26	8.24	9.24
27	9.21	9.56
28	10.18	10.29
29	11.16	11.03
	p.m.	
30	12.18	11.40
31	1.22	..

MINUTES LATER THAN BRISBANE (SOUTHERN DISTRICTS).

Charleville 27; Cunnamulla 29; Dirranbandi 19;
Quilpie 35; Roma 17; Warwick 4.

MINUTES LATER THAN BRISBANE (CENTRAL DISTRICTS).

Date.	Emerald.		Longreach.		Rockhampton.		Winton.	
	Rise.	Set.	Rise.	Set.	Rise.	Set.	Rise.	Set.
1	18	21	34	38	9	12	38	43
6	10	29	26	44	0	19	28	52
11	15	24	31	40	7	15	35	46
16	24	14	40	29	15	4	46	33
21	30	10	45	25	20	0	53	28
26	23	16	39	31	14	7	45	36
31	13	27	28	42	3	18	31	50

MINUTES LATER THAN BRISBANE (NORTHERN DISTRICTS).

Date.	Cairns.		Cloncurry.		Hughenden.		Townsville.	
	Rise.	Set.	Rise.	Set.	Rise.	Set.	Rise.	Set.
1	26	34	48	54	33	39	22	29
3	15	39	41	57	26	42	15	33
5	7	48	36	62	21	48	8	40
7	5	53	35	66	20	51	6	44
9	11	49	38	63	23	49	11	41
11	20	40	44	57	29	42	18	34
13	30	29	51	50	35	35	25	25
15	41	18	57	43	42	28	34	17
17	45	10	61	38	45	23	37	11
19	51	4	65	34	49	20	42	6
21	54	4	67	34	51	20	44	6
23	51	8	65	36	49	22	42	9
25	43	17	59	43	44	27	36	17
27	33	27	53	48	38	33	28	23
29	22	38	46	56	30	41	20	33
31	12	47	39	62	24	47	12	39

Phases of the Moon.—Full Moon, January 7th, 2.47 p.m.; Last Quarter, January 14th, 12.56 p.m.; New Moon, January 22nd, 6.34 p.m.; First Quarter, January, 30th, 10.07 a.m.

On January 20th the sun will rise and set about 23 degrees south of true east and true west respectively, and on the 13th and 28th the moon will rise and set very close to true east and true west respectively.

On January 4th the earth will reach perihelion—the point in its orbit when it is nearest to the sun. There will then be 91½ million miles between the sun and earth.

Mercury.—At the beginning of the month, in the constellation of Sagittarius, will rise about 1 hour before the sun. On the 23rd it will be in line with the sun, after which it will become an evening object, and on the 31st, in the constellation of Capricornus, will set about 25 minutes after the sun.

Venus.—On the 1st of January, in the constellation of Libra, will rise between 2.15 a.m. and 3.15 a.m., and the interval of its rising before sunrise will continue to increase until the 28th when it will reach its greatest angle west of the sun, it will then rise about 3¼ hours before sunrise. On the 31st it will rise between 1.55 a.m. and 3 a.m.

Mars.—Too close in line with the sun for observation, being directly in line with the sun on January 6th.

Jupiter.—At the beginning of the month, Jupiter and Venus will not be far apart, Jupiter, the fainter of the two, will then rise about 15 minutes before Venus. At the end of the month Jupiter will rise about midnight, nearly 2 hours before Venus.

Saturn.—In the constellation of Cancer and now almost in line with Castor and Pollux, at the beginning of the month will rise between 8.15 p.m. and 9.15 p.m., while at the end of the month it will rise just before sunset.

Star Charts.—The chart on the right is for 8.15 p.m. in the south-east corner of Queensland to 9.15 p.m. along the Northern Territory border on the 15th January. (For every degree of longitude we go west, time increases 4 minutes). The chart on the left is for 7 hours later. On each chart the dashed circle is the horizon as viewed from Cape York and the dotted circle is the horizon for places along the New South Wales border. When facing North hold "N" at the bottom; when facing south hold "S" at the bottom and similarly for the other directions. Only the brightest stars are included and the more conspicuous constellations named. The stars which do not change their relation to one another, moving east to west, arrive at any selected position about 4 minutes earlier each night. Thus, at the beginning of the month the stars will be in the positions shown about 1 hour later than the time stated for the 15th and at the end of the month about 1 hour earlier than that time. The positions of the moon and planets, which are continually changing in relation to the stars, are shown for certain marked days. When no date is marked the position is for the middle of the month.

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